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EXXON MINERALS COMPANY

CRANDON PROJECT

ANALOGOUS AREA METHODOLOGY
AND REPORT ON CASE SELECTION

SOCIOECONOMIC ASSESSMENT

EXXON CRANDON PROJECT

SOCIOECONOMIC STUDY

prepared by RPC, Inc.

ANALOGOUS AREA METHODOLOGY AND REPORT ON CASE SELECTION

SOCIOECONOMIC ASSESSMENT

EXXON CRANDON PROJECT

prepared for
Exxon Minerals Company

by
RPC, Inc.
Austin, Texas

October 1981

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We will appreciate any comments you may have on the methods and techniques we describe in this report. You may direct comments and suggestions to any of the following:

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HOW TO USE THIS REPORT

This report is part of a comprehensive study commissioned by Exxon Minerals Company to determine the potential socioeconomic effects of a proposed mine/mill complex in northern Wisconsin. The report describes the techniques we plan to use to compare the potential effects of this project to effects that have occurred in similar areas as a result of similar projects.

Part of the intent of Exxon Minerals Company in commissioning this socioeconomic assessment is that everyone with an interest in the proposed project should have access to the reports concerning the socioeconomic effects that might result from project development. However, this intended readership covers a wide spectrum of types of interests and technical backgrounds. In an effort to provide information for those with nontechnical interests, as well as for readers who want all the statistical and mathematical details, we have designed our reports in two parts. The first part, printed on yellow paper, covers the highlights of the technical work described in the white pages. Readers need not read both parts.

We have organized the technical discussion in the white pages as follows:

- Chapter 1: Purposes and procedure for the study
- Chapter 2: Research design, including rationale for the study, research questions, and preferred data
- Chapter 3: How we select the existing case study areas
- Chapter 4: How we select the new case study area
- Chapter 5: How we select the control areas

The first two chapters state the methodology for the entire analogous areas study. The final three chapters document the completion of the first steps in that methodology. The yellow-page summary section describes the procedures we detail in the white pages, without listing specific data requirements or other technical details.

SUMMARY

Exxon Minerals Company (Exxon) is considering the establishment of a mine/mill complex near Crandon, Wisconsin. This proposed complex would be based on a large ore deposit containing commercial quantities of zinc and copper. Engineering and economic feasibility studies are underway for the project, and environmental studies are in progress to satisfy local, state, and federal regulatory requirements. Exxon estimates that construction and operation phases of the project will each employ about 900 people.

Exxon has retained Research and Planning Consultants, Inc. (RPC) to prepare a comprehensive assessment of potential socioeconomic effects of the Crandon Project. The overall assessment will forecast effects of the project on the local study area's economy, demography, housing and land use, public facilities and services, fiscal capabilities, sociocultural characteristics, and Native American communities. We have conducted statistical surveys in the local study area to supplement available information for these analyses. In addition, we are preparing case studies on areas that share characteristics with the local study area and that have experienced industrial development similar to that expected from the Crandon Project.

In our analogous areas analysis, we will develop a forecast for the local study area on the basis of the experience of similar areas with industrial development similar to the proposed Crandon Project. We use this development forecast to check the quantitative forecasts for the local study area. The local study area for the Crandon Project socioeconomic assessment consists of 40 towns, three cities, and an incorporated village, encompassing most of Forest and Langlade counties and about half of Oneida County in northern Wisconsin.

One broad purpose of this analysis is to gather empirical information on areas and projects similar to the local study area and the Crandon Project with which we can compare the forecasts we develop for the socioeconomic assessment. A second purpose is to select a control area for long-term monitoring of the socioeconomic effects of the Crandon Project. These broad purposes encompass five specific objectives:

1. Document changes that resulted from industrialization in areas similar to the local study area

2. Provide an empirical framework within which we can make reasonable statements about change and by which we can cross-check the results of our socioeconomic assessment

3. Determine which socioeconomic factors we should monitor for effective growth management

4. Document the responses of industry and local governments to rural industrialization in analogous areas and describe the results of these responses

5. Prepare baseline data for an area comparable to the local study area that is not expected to experience development.

The procedure for the analogous area analysis consists of the following nine steps:

1. Develop selection criteria

2. Define contents of studies

3. Select the most analogous cases from the existing literature

4. Select the most analogous case that has not been documented and a control area

5. Select a control area for the local study area suitable for monitoring

6. Gather and analyze data; write narrative

7. Prepare development forecasts for the local study area based on case studies

8. Compare forecasts

9. Resolve differences between forecasts.

RATIONALE

We can learn a great deal about the socioeconomic effects the proposed Crandon Project may have from studying events that

have already occurred in similar situations. Projects that are generally known for their socioeconomic effects, such as energy-development projects in the Rocky Mountain states, have become known because their undesirable effects were of such a magnitude as to be newsworthy. Little public attention is drawn to projects that benefit their host communities. The case studies of projects similar to the Crandon Project in areas similar to the local study area permit a direct and systematic comparison of the socioeconomic forecasts with events that have occurred under conditions similar to those we anticipate for the Crandon Project.

SELECTION CRITERIA AND ISSUES

We have developed criteria for selecting areas and developments for the case studies, and we have defined the issues we will address in each case study. Of the ten selection criteria, six apply to the areas under consideration, and four are criteria for the projects. The values established for the criteria reflect actual conditions in the local study area in 1976 (the year the Crandon Project was announced) and Exxon's anticipated plans for project development as of September 1981.

The set of issues defined, along with the list of data requirements for each issue, provides a standard format for the case studies. Because we want to compare the case studies with the forecasts of socioeconomic effects, we have designed them to include the same issues and concerns addressed in the quantitative forecasts for the local study area. We collect the same types of data for the case studies as for the socioeconomic forecasts to permit more direct comparison between changes that have occurred in analogous areas and those forecast for the local study area. The definition of the content of the case studies will also help Exxon Minerals and state and local governments formulate a program for monitoring the long-term effects of the Crandon Project on the local study area.

RESEARCH QUESTIONS AND PREFERRED DATA

To provide a standard format for the analysis of case studies, we construct a set of research questions and develop a list of data useful to answer each question. Since we want to compare the case studies with the forecasts of socioeconomic effects, we have designed the analogous areas analysis to include

the same topics of concern we address in the quantitative forecasts for the local study area. The areas of concern that we identify to specifically address through the research questions are:

1. Employment and unemployment
2. General economy
3. Population
4. Housing
5. Public facilities and services
6. Fiscal conditions
7. Sociocultural conditions

Furthermore, we collect the same types of data for the case studies, whenever possible, as for the socioeconomic forecasts to permit more direct comparisons between changes that have occurred in analogous areas and those forecast for the local study area.

ANALOGOUS CASES AND CONTROL AREAS

We are selecting three case study areas: two from the existing literature and one that has not been studied. To select the two existing case studies, we examine the available literature on cases of rural industrialization. We then select cases in which the project characteristics matched the Crandon Project in terms of both the type of development (i.e., single development mining/manufacturing industry) and the number of employees (i.e., 800 to 1,200). This procedure results in identifying four projects out of an initial 24 studies which are similar to the proposed Crandon Project. Among these four projects, we apply a set of area criteria to select those documented cases that are most analogous to the local study area. This process yields two case studies--Putnam County, Illinois and Marquette County, Michigan--to be used for the analogous areas analysis of existing case studies. Since the literature on these studies does not contain all the information needed, we use the literature only as a starting point for preparing cases.

To select the new case study, we assemble preliminary information on existing industries in states named in the criterion for location. A preliminary evaluation of these industries on the basis of selected criteria reduces the number under consideration to 62. To complete the selection of a new case study, we first examine the year in which the operation began and the pattern of employment for each case. This procedure results in the identification of Ontonagon County,

Michigan and Dawson County, Nebraska. We then apply unemployment and population criteria to the two new cases and selected Ontonagon County, Michigan for the new case study.

We also select two control areas: one for the new case study, and one for long-term monitoring of socioeconomic effects of the Crandon Project. These geographic areas share broad socioeconomic characteristics with the areas for which they are selected, but they have not experienced large-scale industrial development, nor are they expected to experience such development in the near future.

Comparison of changes in a control area with changes in a project study area allows us to separate effects of a project from effects attributable to broader socioeconomic trends. We assemble the same types of information for the control areas as for the case studies and the local study area. We select Wisconsin's nonmetropolitan counties, other than Forest, Langlade, and Oneida counties, as the control area for the Crandon Project. The control area for Ontonagon County will be those counties in the upper peninsula of Michigan not included in the project area for that case study.

DEVELOPMENT OF CASE STUDIES AND COMPARISON TO CRANDON PROJECT FORECASTS

We have completed the first five steps of the analysis (listed on page iv). The next step is to gather and analyze the necessary data and write a narrative description of the findings. Some of the information needed has been gathered as part of the review of the literature, interpretation of government statistics, visits to the case study areas, and interviews with company and local officials.

Next, we use the findings from the case studies, baseline information on the local study area, and information about the proposed Crandon Project to construct a forecast of development in the local study area based on the empirical evidence in the case studies. We then compare this development forecast with forecasts produced by the quantitative models and other methodologies of the overall socioeconomic assessment.

Finally, we note any differences between the forecasts and either refine the models or methods to reflect the empirical data, or identify differences between the Crandon Project and the case study areas that might explain the differences in the forecasts.

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1. GENERAL APPROACH

This report describes the purposes and methodology for preparing three case studies and comparing a forecast for the local study area based on these case studies with the quantitative forecasts for the local study area. The case studies describe the effects of developments analogous to the proposed Crandon Project on areas analogous to the local study area. We also report on the selection of documented and undocumented case studies, as well as control areas, for comparison to the Crandon Project. Our ongoing philosophy as we develop this analysis is that the assessment of potential socioeconomic effects of the proposed Crandon Project on the local study area can benefit greatly from an understanding of similar areas that have experienced similar development. The quantitative assessment relies heavily on the tools of the economist and the sociologist. The analysis of analogous areas provides an opportunity to verify and improve the forecasts by using the tools of the economic historian.

PROCEDURE

The analysis of analogous areas is an exercise in original research that is unlike most previous work on rural industrialization. The approach is to use selected case studies to assist in predicting the socioeconomic effects of a specific proposed development in a specific area. We also design the case studies in such a way that they are useful in defining a monitoring program for effects of development on that area over a period of years. The procedure for the analogous areas analysis consists of nine steps:

1. Develop criteria for selecting case studies
2. Define a standard format for the case studies in terms of issues to be examined
3. Select the most analogous cases of rural industrialization that have been documented in the literature
4. Select the most analogous case of rural industrialization, that has not been documented in the literature (new case study), and a control area
5. Select a control area for the local study area suitable for monitoring
6. Research the case study areas and projects, analyze the data, and write a narrative description of the findings
7. Develop a forecast for the local study area based on the findings in the case studies
8. Compare the forecast developed from the case studies with the forecast we develop in other elements of the socioeconomic assessment
9. Resolve any differences between the forecasts by refining the models or methodologies or by explaining

differences in circumstances that would account for differences in the forecasts.

Chapter 2 of this document describes the rationale for this analysis as well as a more detailed methodology for completing steps six through nine. The last three chapters describe the completion of steps three through five, the selection criteria, and the selection of documented case studies, a new case study, and control areas for the new case study and local study area. This document, therefore, is a methodology and report on case selection.

The case studies, researched and analyzed for use in the regulatory process, are selected as carefully and objectively as possible. We make every effort not to select case study areas which yield favorable or unfavorable outcomes or forecasts. This effort is reflected in the criteria established for selecting case studies.

PUBLICATION OF RESULTS

In addition to this report, we will publish the results of the analysis when all nine steps are complete.

The case studies we develop as part of this analysis will be a worthwhile contribution to the study of rural industrialization. The results of the analysis, including the selection of study areas reported in this methodology paper, will be published as one of the outputs listed in the study plan for

the socioeconomic assessment (Exxon Minerals Company, 1980). Because the research design involves using the forecasts we develop in the quantitative models and other methodologies, the analogous areas report will be published near the conclusion of the socioeconomic assessment.

The results of the analysis will not be incorporated directly into the Environmental Impact Report to be submitted to the Wisconsin Department of Natural Resources. However, these results will provide supporting documentation for the socioeconomic portions of the Environmental Impact Report.

2. RESEARCH DESIGN

This chapter begins with a discussion of the rationale for studying areas that have been affected by an industrial project as part of an assessment of that project's potential socioeconomic effects. We then describe the procedures in analyzing new and existing case studies. This includes the identification of topics of concern, the development of research questions, and the delineation of data requirements. These procedures enable us to develop narrative descriptions of each case study as well as to examine differences between the case study development forecasts and the quantitative forecasts for the local study area. The chapter concludes with a discussion of the possibility for long-term data collection on the control area for the local study area as part of a socioeconomic monitoring program for the proposed Crandon Project.

RATIONALE FOR THE RESEARCH

The National Environmental Policy Act (42 U.S.C. 4331; as amended, 1975), passed in 1969, required preparation and submission of an impact assessment for major federal decisions that could have a substantial impact on the "human environment."

Numerous state environmental policy acts, passed at or about the same time, repeated the language of this act. The Wisconsin Environmental Policy Act is one of these. It provides as follows:

> "(2) * * * Except as provided in s. 145.022, all agencies of the state shall:
> (c) Include in every recommendation or report on proposals for legislation and other major actions significantly affecting the quality of the human environment, a detailed statement, substantially following the guidelines issued by the United States Council on Environmental Quality under P.L. 91-190, 42 U.S.C. 4331, by the responsible official on:
> 1. The environmental impact of the proposed action;
> 2. Any adverse environmental effects which cannot be avoided should the proposal be implemented;
> 3. Alternatives to the proposed action;
> 4. The relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity; and
> 5. Any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented;
> 6. Such statement shall also contain details of the beneficial aspects of the proposed project, both short term and long term, and the economic advantages and disadvantages of the proposal."
>
> (Ch. 274, Laws of 1971, Wis. Stat. 1.11)

Neither Congress nor the Wisconsin Legislature defined the "human environment." Initially, definition of the term was left to state and federal courts as they interpreted this broad act. Later, the Council on Environmental Quality (CEQ) set forth guidelines for implementing the National Environmental Policy Act (NEPA), the latest issued on July 30, 1979 (40 C.F.R. 1500-1508). In Wisconsin, state agencies are instructed in the statute quoted above (Wis. Stat. 1.11) to follow federal guidelines.

When the NEPA was passed, the purpose was clearly to ensure that federal officials considered the effects of water and air emissions on the natural environment in making decisions that could result in such emissions. Since 1969, however, the types of effects addressed in environmental impact assessments have increased as a result of judicial decisions and through revisions to CEQ guidelines. In some instances, project opponents have procured favorable judicial decisions that added to the scope of effects to be considered. The scope of effects has also been expanded through revisions to CEQ or state guidelines, which came about in response to judicial decisions and an evolving awareness that major projects can have effects beyond the effects of air and water emissions.

Consideration of Socioeconomic Effects

Judicial decisions and revisions to CEQ guidelines have made the coverage of socioeconomic effects an increasingly important part of environmental impact assessments. Early impact statements included only cursory descriptions of socioeconomic variables. Forecasts of without-project futures were limited to brief, qualitative statements. The exceptions tended to be environmental impact statements for federally sponsored projects, such as those prepared by the U.S. Army Corps of Engineers, which required an economic cost-benefit analysis for any federally sponsored project. This led to the development of procedures for

in-depth socioeconomic assessments in the U.S. Departments of Transportation, Interior, Agriculture, and Defense.

After 1973, the socioeconomic effects of major private projects began to be the focus of considerable attention. The Arab oil embargo increased the pace of development of coal, oil shale, and other mineral reserves in the Rocky Mountain states. The sparse population in the coal-producing areas of these states was unable to supply the labor necessary to develop the deposits. This led to substantial inmigration of construction and operation work forces, which created the highly publicized boomtowns.

In these boomtowns, the supplies of housing, public services, and other social amenities were quickly strained, decreasing the quality of life for existing residents. Studies by Gilmore (1978) and Hochman (1979) provide two examples of what has become an extensive literature on the socioeconomic effects of boomtowns. These socioeconomic effects were so pronounced that they have become, in some cases, the major environmental issue in the regulatory process (Marinelli, 1980).

One important effect of boomtowns on the regulatory process is the increased consideration given to social and economic effects in federal and state environmental impact statements. Virtually all the western coal and mineral deposits are on publicly owned land, and the decision to lease these lands for energy development is a major federal or state action, requiring an environmental impact statement. The increasing concern for

potential socioeconomic effects of major projects and the increasing scope of socioeconomic consideration in impact statements has prompted the development of elaborate computer models to perform these assessments (Murdock and Leistritz, 1980).

The notoriety accorded energy boomtowns has increased public awareness of the socioeconomic effects of large industrial projects. Local residents, state environmental groups, and state and local officials have expressed concern about potential effects of the proposed Crandon Project on the local study area. They want to know how the project might affect the local economy, employment, taxes, public services, and sociocultural factors. One of the principal reasons Exxon Minerals Company commissioned a major socioeconomic assessment for the proposed Crandon Project is to address these concerns.

Applicability of the Experience of Other Areas

The proposed Crandon Project is a relatively large industrial development in a relatively rural area. It is reasonable to ask whether the project will produce the same sort of effects in the local study area as mining and power plant projects have produced in some rural areas of Wyoming, Colorado, and other western states.

Even though the proposed Crandon Project may be similar to energy projects in the western states, there are important

differences between conditions in the local study area and conditions in the areas that gave rise to energy boomtowns. Two of the controlling differences are in population and in the local economy:

- Population both in absolute terms and relative to the size of the proposed Crandon Project is much greater in the local study area than in western boomtown areas.
- The development of manufacturing, retail and wholesale trade, housing, and service sectors appears to be much more advanced in the local study area than in places such as Gillette, Wyoming, or Mercer County, North Dakota.

Although the proposed Crandon Project may have socioeconomic effects on the local study area, the more famous boomtowns of the Rocky Mountain states are probably poor predictors of those effects.

However, we can learn a great deal about the potential socioeconomic effects of the Crandon Project if we identify cases of rural industrialization in which <u>not only the projects are similar to the proposed Crandon Project, but in which the areas where the projects were developed are similar to the local study area</u>. Information about the socioeconomic effects of these cases of rural industrialization can suggest ways in which development of the Crandon Project could affect the socioeconomic characteristics of the local study area.

ANALYSIS OF NEW AND EXISTING CASE STUDIES

Research Questions and Preferred Data

There is no standard definition of the approach or theoretical sophistication of a case study. Some researchers include a detailed statistical analysis in their studies while others publish case studies that are primarily anecdotal accounts assembled from interviews with local residents and company officials. If the case studies are to lend themselves to comparison, both with each other and with the proposed Crandon Project, they must address research questions that are examined in the Crandon Project assessment. They should also contain the same types of statistics produced with the quantitative models and other methodologies.

It is equally important to decide what to omit from the case studies. The purposes in preparing the case studies are not served by including definitive histories of the communities or companies, or by analyzing local politics or the particular personalities within the communities.

Community members and research scholars have voiced concern over several social and economic areas which may be affected by industrial development. We attempt to identify these areas of concern through several sources:

1. A review of the literature on the effects of industrial development in rural areas

2. A review of the literature on the effects of energy development in the western United States, especially the energy boomtown phenomena

3. Meetings with officials and citizens in the local study area

4. Interviews and discussions with state officials and academicians who have studied local impact assessment

5. Discussions with the staff of the North Central Wisconsin Regional Planning Commission

6. Development of the study plan for the socioeconomic analysis of the proposed Crandon Project.

One of the most useful sources in identifying areas of concern was produced by the North Central Wisconsin Regional Planning Commission (NCWRPC). The Commission staff met with officials of the local study area from December 1978 through February 1979 and produced a document entitled Concerns of Local Officials on Future Impacts of Mining in the Crandon, Wisconsin Area (NCWRPC, 1979). Subsequent meetings between the representatives from Exxon Minerals, RPC, and local community members further clarified concerns about the possible effects of development. Based upon these meetings and a review of the literature, seven social and economic areas of concern were identified:

1. Employment and unemployment
2. General economy
3. Population
4. Housing
5. Public facilities and services
6. Fiscal conditions
7. Sociocultural conditions.

After closely examining the local concerns in each of these areas, the literature review, and the objectives of other analyses in the socioeconomic study of the Crandon Project, we constructed a series of research questions we wanted to answer about the case studies. Each of the research questions addresses a social or economic area of concern previously outlined. Table 1 presents the research questions and summarizes the type of data useful to answer each question. Since we have no single set of rigorously derived theoretical expectations concerning what development effects we might find, the research questions are formulated in general terms to guide the analyses. They are also formulated in general terms so as to provide an ease of comparability and generalizability between case studies and the Crandon Project socioeconomic study.

The specific types of data we collect for the case analyses are intended to answer the research questions and will be included in the statistical forecasts we produce in other analyses. It is the similarity between the types of data that enables us to compare the forecasts from the case studies with quantitative forecasts for the proposed Crandon Project.

The data we collect for the case studies include most of the variables that might be tracked in a socioeconomic monitoring program. By examining the descriptive and predictive power of these variables in the case studies, we have a basis to suggest

Table 1

RESEARCH QUESTIONS AND PREFERRED DATA FOR CASE STUDIES AND CONTROL AREAS

Research Questions	Preferred Data
1. What are the effects of economic and resource development on employment and unemployment?	Total employed by occupation Professional/technical Nonprofessional Service by industry Average wage rate (selected sectors) Professional/technical Nonprofessional Service Industry Unemployment rate
2. What are the effects of industrial development on the general economy of the local area?	Retail sales Household income Less than $10,000 $10,000 to $25,000 More than $25,000 Median income Employment changes
3. What are the effects of industrial development on population changes and net migration?	Total population Males Females Net migration Population density per square mile Urban/rural distribution Urban population Rural population

(continued)

(Table 1, continued)

Research Questions	Preferred Data
4. What are the effects of industrial development on housing market supply and demand?	Rental units Vacancy rate Available units Representative rent/unit Nonrental units Housing starts Resales Average selling price
5. What are the effects of industrial development on the demand and supply of public facilities and services?	Fire protection Population served Personnel Police protection Population served Personnel Solid waste disposal Population served Disposal sites Operation personnel Education Students Full-time teachers Health care Hospitals and clinics Beds Full-time professionals Water supply Population served Personnel

(continued)

(Table 1, continued)

Research Questions	Preferred Data
6. What are the direct and indirect effects of industrial development on public revenues and costs?	Expenditures for facilities and services Administration Police protection Fire protection Streets Sewer Sanitation Parks and recreation Hospital and health services Transportation Social services General public buildings Education: cocurricular and student activities Library Total Revenues Taxes Tax rate Assessed valuation Total revenues Total taxes collected Licenses and permits Fines Use of money and property Water Sewer Total Bond indebtedness
7. What are the effects of industrial development on the sociocultural characteristics of the project area?	Crimes against persons and property Divorces filed Suicides Schooling Student/teacher ratio Average daily attendance Dropout rate Expenditures/student

NOTE

Where preferred data is not available, other statistics or qualitative data from interviews may be used instead.

SOURCE

Research and Planning Consultants, Inc.

variables to include in a program to monitor socioeconomic effects of the Crandon Project in the local study area.

We attempt to gather the preferred data for the existing case studies from the case study documents. Data for the existing case studies may differ, therefore, due to the number and scope of effort of the case study documents on each of the three cases. Data collected for the new case study, new case study control area, and the Crandon monitoring control area, are presented for all of the research questions.

Case Study Narratives

We prepare a narrative description of each case study, presenting additional descriptive data regarding the area and the development. Within this narrative, we analyze the statistics and draw conclusions on several topics, including the research question posed for each area of concern. The appendix contains a general outline for the case study narratives.

Development Forecast

One objective of the analogous areas study is to use the past experience of other areas to cross-check the forecasts of changes in the local study area that may result from the proposed Crandon Project. To accomplish this objective, we develop a

forecast for the local study area based on the following previously prepared materials:

1. The four case studies
2. Baseline profile of the local study area
3. Description of the Crandon Project scenarios.

Using statistical and qualitative analyses, we examine the similarities and differences between the case study areas and the local study area and between the case study development and the Crandon Project scenarios. From this comparison, we develop a forecast of the probable effects of the Crandon Project scenarios on the local study area. This development forecast covers the same questions researched for the case studies.

Because we are basing the development forecast on only four case studies, we limit the analysis to the direction and significance of changes, rather than attempt to forecast certain percentage changes in population, employment, or other issues. However, this level of analysis will nevertheless provide an important check on the validity of the methodologies and quantitative models we are using to develop detailed forecasts for the local study area.

Comparison to Quantitative Forecasts

We compare each of the issues in the development forecast described above with the following preliminary forecasts for project scenarios from other elements of the socioeconomic assessment:

1. Economic conditions (including effects on retail trade, agriculture, forestry, and recreation/tourism)

2. Demographic conditions

3. Housing market conditions

4. Public facilities and services

5. Fiscal conditions

6. Sociocultural characteristics

7. Native American communities (if applicable to the development forecast).

The comparison of the forecast based on analogous areas with the preliminary forecasts for the overall socioeconomic study focuses on the differences. We list these differences and explore their causes. In each instance, we consider whether the difference is due to differences between the analogous areas and the local study area or between the case study development and the Crandon Project scenarios. We also consider whether the differences occur because we need to refine the methodologies or quantitative models. We state the conclusions and the reasons for substantial differences, and refine the models and methodologies, if appropriate.

SOCIOECONOMIC MONITORING: THE CONTROL AREA

The proposed Crandon Project will cause certain changes in the local study area. However, not every change that occurs in the local study area during the life of the project will be a result of project development. During the beginning stages of

the project, the local study area will experience changes resulting from broader economic and demographic trends. To measure and manage the effects of industrialization, government and company officials may want to develop a socioeconomic monitoring program. Such a program would be designed to permit comparison of changes in the local study area with changes in a control area.

3. SELECTION OF EXISTING CASE STUDIES

We are undertaking the process of selecting case study areas with the goal of identifying one to five already well-documented case studies in the existing literature that had predevelopment characteristics similar to those of the local study area in 1976, when plans for the proposed Crandon Project were announced.

THE CASE STUDY LITERATURE

There is a considerable body of literature dealing with various aspects of the effects of development on rural communities. This case study literature is found in academic journals and reports and in publications of various government agencies. We use the following computer-based indexes and published bibliographies to select academic literature to review for potential case studies:

1. Social Sciences Citation Index
2. Public Affairs Information Service
3. Sociological abstracts
4. Agricultural Information on Line Access (AGRICOLA)
5. Indexes to state agricultural experiment stations

6. Dissertation abstracts

7. Published bibliographies on nonmetropolitan industrial development.

Government publications on community development are found in the following listings:

1. Energy Research Index
2. Old West Regional Commission Index
3. Computer-based search of U.S. government publications.

A search of these abstracts and indexes provides us with the initial references on case study and growth management information. Other sources are added from our library and from the libraries of our staff and subcontractors.

Using certain key words that relate to the objectives of the analysis, about 700 sources are obtained by computer search. The key words are terms such as "rural growth," "rural development," "fiscal impact," and "mining impact." Most case studies concern industrial manufacturing plants, although there are several on mining projects. Not all of the citations obtained are useful, however. Some deal with other countries; others cannot really be called case studies. The citations used are included in the list of references.

We categorize the initial list of case studies as follows:

1. Forecasts of effects from a baseline

2. Analyses of effects resulting from a previous development, at a single point in time

3. Longitudinal studies that analyze a community before, during, and after the occurrence of significant development, or at any two of the three times during development.

Only the last category of study is useful for our purposes. Narrowing the search to this category eliminates most environmental impact statements and development forecasts as possible materials for an existing case study. After screening the initial set of citations, we are left with 24 potentially useful case studies.

To merit further consideration, we feel the case studies would have to be similar to the proposed Crandon Project (rather than the local study area) on two characteristics: the type of development and the number of employees.

We decided to consider only nongovernment installations for the case studies. The difference between private and public employment policies and the political basis for the growth or decline of government facilities makes it desirable to concentrate on a project in the private sector. Furthermore, since the proposed Crandon Project is the only expected industrial development in the local study area, it was decided that cases in which only one major development was underway at the time would be considered. If a single development has been the source of industrial growth in the project area at a given point in time, we can examine the growth management policies of the developing corporation and of the state and local governments. In addition, the effects of a combination of several major projects are far greater than the effects of individual projects.

Finally, the number of construction and operation workers employed in a project is an important determinant of the project's socioeconomic effects on the community. Therefore, it is important that the construction and operation employment approximate that of the Crandon Project. As of September 1981, Exxon Minerals Company estimates that the average annual employment for both construction and operation of the proposed Crandon Project will be about 900 workers. For the case studies, employment during either construction or the initial years of operation should not have been less than 800 workers or more than 1,200 workers.

After reviewing the type of development and project employment characteristics of the 24 potentially useful cases (Table 2), we find that only four case studies comply with both characteristics. These case studies included Jackson County, Iowa; Jackson County, West Virginia; Putnam County, Illinois; and Marquette County, Michigan.

AREA SELECTION CRITERIA FOR EXISTING CASE STUDIES

For the four potential case studies of rural industrialization to have any predictive value for the local study area, the areas for the cases must be comparable to the Crandon Project area. Four area criteria are defined in order to objectively and systematically identify which of the four existing cases is most comparable to the Crandon Project local

Table 2

TYPE OF DEVELOPMENT AND PROJECT EMPLOYMENT
FOR 24 DOCUMENTED CASE STUDIES

Case	Reference	Type of Development	No. of Employees
Jackson County, Iowa	26, 27	Manufacturing; Single development	965
Jackson County, West Virginia	21	Manufacturing; Single development	890
Putnam County, Illinois	1-4, 10-16, 25, 34-41, 44-52	Manufacturing; Single development	1,050
Box Elder County, Utah	7, 32	Manufacturing; Single development	3,149
Chickasaw County, Mississippi	30, 54	Manufacturing; Single development	130
Clay County, Indiana	8	Mining; Single development	180
Juab and San Pete Counties, Utah	9	Manufacturing; Single development	283
Laurel County, Kentucky	17-19	Manufacturing; Single development	100
Lawrence County, Tennessee	31	Manufacturing; Single development	2,000
Marquette County, Michigan	22, 33	Mining; Single development	1,000
Pike County, Indiana	8	Mining; Single development	374

(continued)

(Table 2, continued)

Case	Reference	Type of Development	No. of Employees
Sandoval County, New Mexico	24	Mining; Single development	135
Tangipahoa Parish, Louisiana	5, 6	Manufacturing; Single development	500
Rio Blanco County, Colorado	29	Mining; Multiple development	Not available
Fleming County, Kentucky	17-19	Manufacturing; Multiple development	205
Holmes County, Mississippi	53	Manufacturing; Single development	50
Lincoln County Kentucky	17-19	Manufacturing; Multiple development	200
Marion County, Kentucky	17-19	Manufacturing; Multiple development	375
Russell County, Kentucky	17-19	Manufacturing; Multiple development	125
Stutsmar County, North Dakota	23	Manufacturing; Multiple development	390
Sweetwater County, Wyoming	20	Mining/Manufacturing; Multiple development	4,000 construction 1,100 operations
Cherokee County, Oklahoma	42, 43	Manufacturing; Multiple development	Not Available
Cochise County, Arizona	28	Mining/Manufacturing; Multiple development	1,600
Eastern Oklahoma Development District	42, 43	Manufacturing; Multiple development	753

(continued)

(Table 2, continued)

Reference Key

Ref. No.		Ref. No.	
1	Beck, 1972	29	Longbrake and Geyler, 1979
2	Beck et al., 1973	30	Maitland and Wilber, 1958
3	Beck and Summers, 1973a	31	Martin, 1960
4	Beck and Summers, 1973b	32	McArthur and Coppedge, 1969
5	Bertrand and Osborne, 1959a	33	Michigan Dept. of Commerce, 1972
6	Bertrand and Osborne, 1959b	34	Ramana, 1968
7	Black et al., n.d.	35	Scott, 1973
8	Callahan and Callahan, 1971	36	Scott and Chen, 1973
9	Christian et al., 1959	37	Scott and Summers, 1974
10	Clark et al., 1968	38	Scott and Wahi, 1974
11	Clemente et al., 1974	39	Scruggs and Hammond, 1966
12	Clemente and Summers, 1972	40	Scruggs and Hammond, 1968
13	Clemente and Summers, 1973a	41	Seiler and Summers, 1979
14	Clemente and Summers, 1973b	42	Shaffer, 1972
15	Clemente and Summers, 1974	43	Shaffer, 1974
16	Clemente and Summers, 1975	44	Summers, 1974
17	Garrison, 1970	45	Summers, 1977
18	Garrison, 1971	46	Summers, 1978
19	Garrison, 1972	47	Summers et al., 1968
20	Gilmore and Duff, 1975	48	Summers and Beck, 1972
21	Gray, 1969	49	Summers and Clemente, 1973a
22	Heath et al., 1977	50	Summers and Clemente, 1973b
23	Helgeson and Zink, 1973	51	Summers and Clemente, 1976
24	Ives and Eastman, 1975	52	Summers and Lang, 1976
25	Johnson, 1968	53	U.S. Dept. of Agriculture, 1970
26	Kaldor et al., 1964	54	Wilber and Maitland, 1963
27	Kaldor and Bauder, 1963		
28	Layton and Ayer, 1972		

SOURCE

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study area. These criteria and their acceptable values are derived from preliminary work by a rural sociologist in consultation with the staff of Exxon Minerals Company (Summers, 1979). Table 3 is a list of these criteria and their acceptable values. The following sections explain the importance of each of the criteria in examining analogous areas for selecting the existing cases.

Population

The effects of a new development on an area depend in part on the size of the project relative to the size of the area. The socioeconomic effects of creating 500 new jobs in Milwaukee are very different from creating 500 new jobs in Wabeno. We want the population of the project area for the case studies to be within plus 10 percent of the local study area as of the 1970 census. A project area with a population less than the local study area could only serve to magnify effects; however, a project area with a population more than 10 percent greater would tend to minimize project effects. The total population of the local study area in 1970 was approximately 50,000 people. Thus, the project area population for the case studies should not exceed 55,000 at the last census preceding the development. Although the city limits of Rhinelander contain only about 10,000 people, the Rhinelander area contains approximately 25,000 people. To be considered similar, the largest city in the case study project area should

Table 3

SELECTION CRITERIA FOR DOCUMENTED CASE STUDIES

Criterion	Acceptable Values
Population	At last census preceding development, the local study area + 10%: for project area, not exceeding 55,000; for largest city, not exceeding 27,500.
Distance	75 miles or more from central city of nearest Standard Metropolitan Statistical Area (SMSA)
Unemployment	At time project was announced, at least 10% greater than state rate.
Location	Illinois, Indiana, Iowa, Minnesota, Michigan, Wisconsin, Ohio, Maine, Vermont, New Hampshire, North Dakota, South Dakota, Nebraska.

SOURCE

Research and Planning Consultants, Inc.

have a population not exceeding 27,500 (25,000 plus 10 percent; see discussion above).

Distance

The distance of a project site from large population centers has a definite influence on the socioeconomic effects construction of a major industrial project is likely to have on the area. If the project site can be reached from a large population center within an hour and a half, much of the construction labor force may commute daily, minimizing the socioeconomic effects on the project area. On the other hand, if the area is sufficiently far from a population center that construction employees who cannot be hired locally must move to the area for an extended period, the housing market and public facilities and services may be strained by the increase in population.

We use the U.S. Department of Commerce definition of a Standard Metropolitan Statistical Area (SMSA) to identify population centers (U.S. Department of Commerce, Bureau of the Census, 1973). If the distance from the SMSA to the project site is greater than 75 miles, workers are likely to relocate their residences rather than commute. Thus, in selecting projects for the case studies, we look for development sites that are located 75 or more miles from the central city of the nearest SMSA at the time plans for development were announced.

Unemployment

Any rural industrial development will have to hire some specialized technical and professional workers from outside the local area. However, the extent of hiring construction and operation workers from outside the area usually depends on characteristics of the local labor market. If there is considerable unemployment in the area, chances are greater that a large percentage of the unskilled and semiskilled workers for construction and operation can be hired locally. This reduces inmigration and, thus, reduces the socioeconomic effects of the development. On the other hand, if the local unemployment rate is low, more inmigrants will be attracted to the area by relatively favorable economic conditions.

The local study area unemployment was approximately 7.1 percent in 1976, at the time the Crandon Project was announced (Wisconsin Department of Industry, Labor and Human Relations, 1976). This was above the state unemployment rate of 5.6 percent. The project area for the case studies should have an unemployment rate at least 10 percent greater than the state rate at the time the project was announced. This difference in unemployment rates indicates slack in the local labor market similar to that in the local study area at the time the Crandon Project was announced.

Location

Geographic similarity is important in selecting documented cases with predictive value for the local study area. Rural areas in regions that are different from Wisconsin Northlands could result in different effects from industrialization than would occur in the local study area. In rural areas in the South, for example, the socioeconomic effects of industrialization over the past several decades have been intertwined with issues of race relations and unionization. In the Rocky Mountain states and the states of the desert Southwest, the rural economy tends to be much simpler, lacking anything comparable to the forestry and forest products industry in northern Wisconsin. Sparsely settled ranchlands with little urban infrastructure clearly present conditions different from those in the Northlands. Therefore, case studies of industrial development in Midwest states should be given primary consideration. Furthermore, Maine, New Hampshire, and Vermont should also be given primary consideration because of their environmental and economic similarity to Wisconsin's Northlands. Note that we include South Dakota, North Dakota, and Nebraska in our definition of the Midwest. While these states lie on the fringes of what is typically considered the Midwest, we include them in our criterion to ensure that we do not overlook case studies which may be similar to the proposed Crandon Project.

FINAL SELECTION

Each of the areas for the four case studies are examined to determine whether they meet the area selection criteria. Table 4 provides the data on each case study. Since it would be impossible to find an existing case study which meets all of the area criteria, the cases which conform to most of the criteria are selected. A case study is given a score of "1" on a criterion if it meets that criterion. Otherwise, the case study scores "0" on that criterion. The criteria are then summed for each case study and the case studies with the highest scores are selected for subsequent analyses. Table 4 indicates that the two case studies with the highest scores are Putnam County, Illinois and Marquette County, Michigan. Both are also well documented. For Jackson County, Iowa, the next highest score, only a very small amount of the necessary documentation is available for this case study. For these reasons Putnam County, Illinois and Marquette County, Michigan will be the existing case studies analyzed in the analogous area study.

Table 4

AREA-CRITERIA DATA AND SCORING FOR
DOCUMENTED CASE STUDIES

Criterion	Jackson County, Iowa		Jackson County, West Va.		Putnam County, Illinois		Marquette County, Michigan	
	Data	Score	Data	Score	Data	Score	Data	Score
Population[a]	1950: 18,600	1	1950: 15,300	1	1960: 53,700	1	1970: 64,700	0
Distance	30 miles	0	50 miles	0	40 miles	0	100 miles	1
Unemployment	1950: County 1.8% State 1.8%	0	1950: County 3.4% State 4.5%	0	1966: County 3.6% State 2.8%	1	1972: County 10.6% State 8.6%	1
Location	Iowa	1	West Va.	0	Illinois	1	Michigan	1
Total Score		2		1		3		3

NOTE

[a]No case study county contains a city larger than 27,500; therefore, the case studies are only scored for the county population criterion.

SOURCE

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4. SELECTION OF A NEW CASE STUDY

The search for a new, undocumented case study area varies in some respects from the selection of a documented case study area from the literature. Since we are not restricted to industrial developments that are previously documented in the literature, we follow a different selection procedure in identifying an undocumented case that would be most analogous to the Crandon Project. We first list acceptable states and then acceptable counties within those states using location and distance criteria. We then apply two project criteria to determine which case would be most similar to the characteristics of the Crandon Project--year of operation and employment pattern. Finally, we apply two area criteria to select the new case study, county population and county unemployment rates.

ASSEMBLY OF POTENTIAL CASES

Since geographic similarity is important in selecting a case with predictive value for the local study area, we begin the search for a new case study by identifying states in the Midwest and upper Northeast. The states we selected in searching for a new case study include North Dakota, South Dakota, Nebraska,

Illinois, Indiana, Iowa, Michigan, Minnesota, Wisconsin, Ohio, Maine, Vermont, and New Hampshire.

Within these states we identify counties that are, in part or in whole, more than 75 miles from the city center of the nearest SMSA. For each state, we obtain a map showing county lines and 1970 SMSAs and use a compass to draw a circle representing a 75-mile radius around each SMSA. We compile separate lists of counties totally beyond the 75-mile radius of each circle and counties partially beyond the 75-mile radius (Table 5).

We then use a computer data base, "EIS Industrial Plants," to identify mining and industrial facilities within these counties. This data base, compiled by Economic Information Systems, Inc., contains data on all plants in the United States with annual sales of more than $500,000. EIS updates the file three times a year with data generated from business magazines, trade journals, state industrial directories, corporate financial reports, and statistics from the U.S. Bureau of the Census. Also included are inputs received directly from companies and corporations. Figure 1 shows the types of information the file contains for each industry. The EIS file contains only information on plants in operation in 1980. This would exclude plants that closed in 1950 as well as those that closed in 1979.

We searched the EIS data base for plants in each county with current employment from 500 to 999 and from 1,000 to 1,499 (the

Table 5

POTENTIAL COUNTIES FOR NEW CASE STUDY

Counties Totally Beyond 75 Miles

Illinois

Alexander	Johnson	Quincy	Wayne
Edwards	Lawrence	Richland	White
Gallatin	Massac	Saline	Williamson
Hamilton	Pope	Union	
Hardin	Pulaski	Wabash	

Indiana

(none)

Iowa

Dickinson	Emmet	Kossuth	Palo Alto

Maine

Arroostook	Washington

Michigan

Alger	Crawford	Houghton	Marquette
Alpena	Delta	Iron	Menominee
Baraga	Dickinson	Kalkaska	Montgomery
Benzie	Emmet	Keweenaw	Ontonagon
Charlevoix	Gogebic	Leelanau	Otsego
Cheboygan	Grand Traverse	Luce	Presque Isle
Chippewa		Mackinac	Schoolcraft

Minnesota

Big Stone	Lac qui Parle	Lyon	Redwood
Cottonwood		Martin	Rock
Hubbard	Lake of the Woods	Murray	Watonwan
Jackson		Nobles	Yellow Medicine
Koochiching	Lincoln	Pipestone	

Nebraska

Adams	Dawson	Hayes	Morrill
Arthur	Deuel	Hitchcock	Perkins
Banner	Dundy	Holt	Phelps
Blaine	Franklin	Hooker	Red Willow
Box Butte	Frontier	Howard	Rock
Boyd	Furnas	Kearney	Scotts Bluff
Brown	Garden	Keith	Sheridan
Buffalo	Garfield	Keya Paha	Sherman
Chase	Gasper	Kimball	Sioux
Cherry	Grant	Lincoln	Thomas
Cheyenne	Greeley	Logan	Valley
Custer	Hall	Loup	Webster
Dawes	Harlan	McPherson	Wheeler

Counties Partially Beyond 75 Miles

Illinois

Adams	Franklin	Jasper	Pike
Clay	Hancock	Jefferson	
Crawford	Jackson	Marion	

Indiana

(none)

Iowa

Appanoose	Clay	Osceola	Winnebago
Buena Vista	Davis	Sac	Worth
Calhoun	Hancock	Taylor	Wright
Carroll	Lee	Van Buren	

Maine

Franklin	Oxford	Piscataquis
Hancock	Penobscot	Somerset

Michigan

Alcona	Missaukee	Wexford
Manistee	Oscoda	

Minnesota

Aitkin	Clearwater	Itasca	Swift
Beltrami	Cook	Lake	Traverse
Blue Earth	Crow Wing	Roseau	Wadena
Cass	Faribault	Stevens	
Chippewa	Grant	St. Louis	

Nebraska

Antelope	Knox	Nance
Clay	Madison	Nuckolls
Hamilton	Merrick	Platte

(continued)

(Table 5, continued)

Counties Totally Beyond 75 Miles			
New Hampshire			
Coos			
North Dakota			
Benson	Divide	Mountrail	Towner
Billings	Golden Valley	Pierce	Ward
Bottineau	McKenzie	Renville	Williams
Burke		Rolette	
Ohio			
(none)			
South Dakota			
Aurora	Day	Hyde	Spink
Brown	Dewey	Jerauld	Stanley
Brule	Edmunds	Jones	Sully
Buffalo	Faulk	Marshall	Todd
Campbell	Grant	McPherson	Tripp
Codington	Gregory	Mellette	Walworth
Corson	Hand	Roberts	
	Hughes		
Vermont			
Addison	Essex	Orange	Windham
Bennington	Franklin	Orleans	Windsor
Caledonia	Grand Isle	Rutland	
Chittenden	Lamoille	Washington	
Wisconsin			
Florence	Iron	Oneida	
Forest	Lincoln	Vilas	

Counties Partially Beyond 75 Miles			
New Hampshire			
Carroll	Grafton		
North Dakota			
Adams	Eddy	McIntosh	Sargent
Benson	Foster	McLean	Stark
Cavalier	Hettinger	Mercer	Stutsman
Dickey	La Moure	Pembina	Wells
Dunn	Logan	Ramsey	
Ohio			
(none)			
South Dakota			
Beadle	Davison	Hamlin	Sanborn
Bennet	Deuel	Harding	Shannon
Bon Homme	Douglas	Jackson	Washabaugh
Charles Mix	Haakon	Perkins	Ziebach
Vermont			
(none)			
Wisconsin			
Ashland	Juneau	Monroe	Sawyer
Crawford	Langlade	Oconto	Taylor
Door	Marathon	Price	Vernon
Grant	Marinette	Richland	Wood

SOURCE

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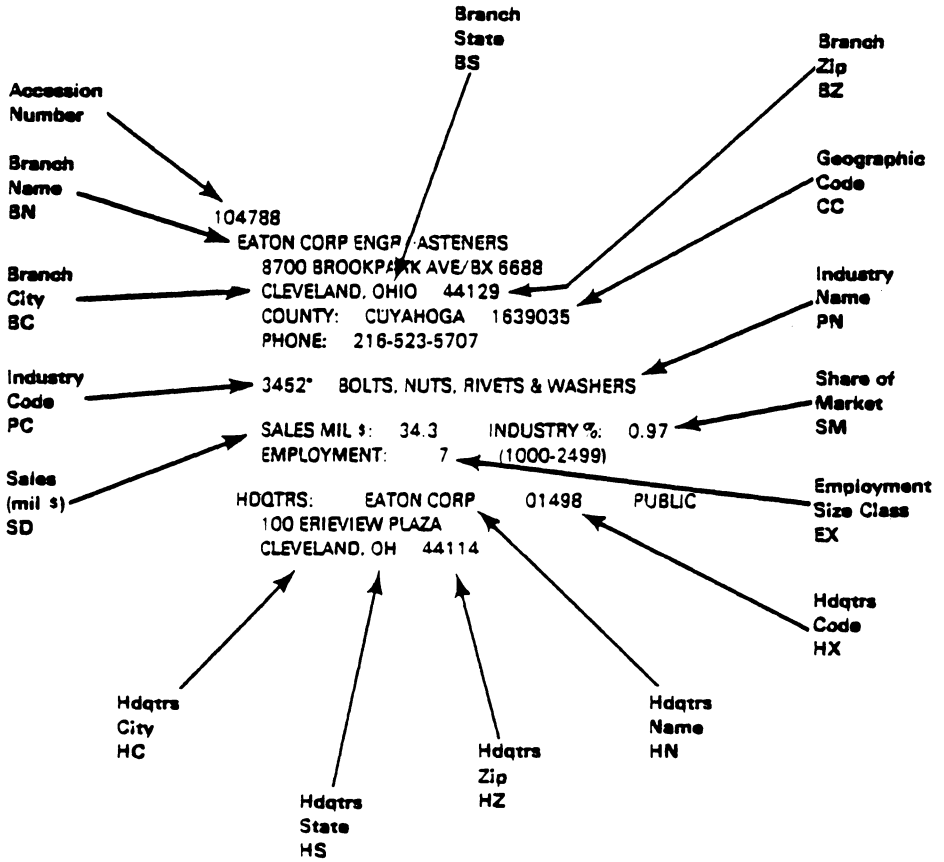
FIGURE 1

PLANT INFORMATION IN THE EIS DATA BASE



SOURCE

Predicasts, Inc. Predicasts Terminal System User's Manual. 1979. "Sample EIS Plant File." Cleveland, Ohio.

employment classes in the data base). This search resulted in a printout listing the number of plants in each county that are in these employment classes. We then printed the full record for each of these plants, including the exact address. This allows us to identify and eliminate any projects located within 75 miles of the central city of an SMSA.

FINAL SELECTION

The steps just described produce a list of 62 potential new case studies (Table 6). To select a new case study for analysis, two crucial project criteria must be met:

1. Year operation began
2. Employment pattern

The year in which the development occurred affects the feasibility of collecting pre- and post-development data on the new case study. The availability of data decreases as the time from project development increases. Before 1940, state and federal agencies collected few socioeconomic statistics. Thus, developments that began operations before 1940 are not considered. We also do not consider developments that are not currently in operation. A study of a defunct plant is substantially more difficult than a study of one presently in operation. Corporate managers and records are more readily available for a current operation and persons who work, or worked, at the plant are more likely to be in the area.

Table 6

PROJECT TIME OF DEVELOPMENT AND EMPLOYMENT DATA
FOR POTENTIAL NEW CASE STUDY[a]

Name of Firm	Location	Type of Development	Time of Development	Employment		
				Number of Employees When Oper. Began	Employees Now	Employment 4 Years After Oper. Began
Marvin Lumber & Cedar Co.	Roseau, MN	Millwork	1905	5	932	
Polaris Div. Textron	Roseau, MN	Transportation Equipment	1945	15-20	630	
Book Press Inc.	Windham, VT	Book Printing	1955	150	1,000	<800
Jones & Lamson/Waterbury F	Windsor, VT	Machine Tools (Metal)	1876		1,100	
General Electric Co., Inc.	Rutland, VT	Aircraft Engines and Parts	1951	20	1,000	<800
Vermont Marble Co., Inc.	Rutland, VT	Cut Stone and Stone Products	1880	5-10	480	
Simmonds Precision Products	Addison, VT	Aircraft Equipment, NEC	1941	33	Refused	
Union Carbide Corp.	Franklin, VT	Primary Batteries, Wet/Dry	Refused	Refused	Refused	
Union Carbide Corp.	Bennington, VT	Primary Batteries, Wet/Dry	1942		600	
Cone-Blanchard	Windsor, VT	Machine Tools (Metal)	1919	13	815	
Fellows Corp.	Windsor, VT	Machine Tools (Metal)	1919		956	
Bryant Chucking Grinder	Windsor, VT	Machine Tools (Metal)	1909	30	638	
Fair Banks Morse, Inc.	Caledonia, VT	Scales-Balances, Exc. Lab	1830		475	
Goodyear Tire & Rubber	Windsor, VT	Boot/Shoe Cut Stock/Findings	1936		350	
Beecher Falls Dv. Ethan Allen	Essex, VT	Wood Household Furniture	1936	30	600	
Ethan Allen Inc.	Orleans, VT	Wood Household Furniture	1953	40	735	
Guilford Industries, Inc.	Piscataquis, ME	Weaving/Finishing/Mills/Wool	1936	300	825	
American Can Co.	Marathon, WI	Sanitary Food	1920		500	
Wausau Paper Mills Co., Inc.	Marathon, WI	Paper Mills Except Bldg. Paper	1900		700	
Mosinee Paper Corp.	Marathon, WI	Paper Mills Except Bldg. Paper	1913	100	593	
Wausau Homes, Inc.	Marathon, WI	Prefabricated Wood Buildings	1959	10	300	
Marathon Electric Mfg. Corp.	Marathon, WI	Motors/Generators	1913	25-50	2,000	
Nekoosa Papers Inc.	Wood, WI	Paper Mills Except Bldg. Paper	1893	50	730	
Nekoosa Papers Inc.	Wood, WI	Paper Mills Except Bldg. Paper	1896	50	1,200	
Niagara of Wisc. Paper Corp.	Marinette, WI	Paper Mills Except Bldg. Paper	1972	650	650	
Shaffer Eaton Div. Textron 3	Lee, IA	Pens/Mechanical Pencils	1912	7	1,450	
Sheller Globe Corp.	Lee, IA	Fabricated Rubber Products, NEC	Refused	Refused	Refused	
Fraser Paper Ltd.	Aroostook, ME	Paper Mills Except Bldg. Paper	1929	10	1,100	
Vahlsing Inc.	Aroostook, ME	Telephone Disconnected, No New Listing				
Potato Service Inc.	Aroostook Isle, ME	Frozen Fruits/Vegetables	1962	200	1,000	<800
Marshall Foods Inc.	Lyon, MN	Poultry/Egg Processing	1928	25	200	

(continued)

(Table 6, continued)

Name of Firm	Location	Type of Development	Time of Development	Employment: Number of Employees When Oper. Began	Employment: Employees Now	Employment: Employment 4 Years After Oper. Began
Campbell Soup Co., Inc.	Nobles, MN	Canned Specialties	1957	1,400	600	
Stokely-Van Camp Inc.	Martin, MN	Frozen Specialties	1900	15	250	
Fairmont Railway Motors	Martin, MN	Railroad Equipment	1909	3	700	
Teledyne Aerospace Systems	Martin, MN	Machinery, Exc. Elec., NEC	1965	110	75	
White Pine Copper	Ontonagon, MI	Copper Rolling/Drawing	1953	800	1,325	
Empire Iron Mining Co.	Marquette, MI	Iron Ores	1963	35	1,400	<800
Negaunee Mine Co. Mather MN.	Marquette, MI	Iron Ores	Closed Down			
Escanaba Paper Co. Div. Mead	Delta, MI	Paper Mills Except Bldg. Paper	1920	200	1,100	
Harnischfeger/Truck Crane	Delta, MI	Construction/Machinery	1948	20	980	<800
Besser Co., Inc.	Alpena, MI	Special Industry Machinery Co.	1904	10	530	
Chef Pierre Inc.	Grand Traverse, MI	Frozen Specialties	1967	20	920	<800
TRW Capacitor Div.	Keith, NE	Electronic Capacitors	1960	Refused	Refused	
Monroe Auto Equipment Co.	Dawson, NE	Motor Vehicle Parts/Accessories	1961	204	620	
Sperry New Holland	Dawson, NE	Farm Machinery/Equipment	1974	875	875	
Becton Dickinson Co.	Phelps, NE	Surgical/Medical Instruments	1966	50	730	
Brown Co. Berlin-Graham	Coos. NH	Pulp Mills	1888	Est. 50	1,787	
Converse Rubber Co.	Coos, NH	Rubber/Plastics Footwear	No Answer			
Rhinelander Paper Co.	Oneida, WI	Paper Mills Except Bldg. Paper	1903	150	850	
Owens-Illinois Forest Prod.	Lincoln, WI	Paper Board Mills	1920	5	400	
Texaco Inc.	Lawrence, IL	Petroleum Refining	1907	5	504	
Airtex Prod. Co., Inc.	Wayne, IL	Motor Vehicle Parts/ACC	1935	85	850	
Snap On Tools Corp.	Wabash, IL	Hand/Edge Tools, NEC	1937	30	831	
Amax Coal Wabash Mine	Wabash, IL	Bituminous Coal/Lignite	1973	12	Refused	
Norge Co.	Williamson, IL	Household Laundry Equipment	1946	700	1,300	<800
Olin-Energy Sys/Ordell Wks	Williamson, IL	Explosives	1958	100	350	
Allen Industries Inc.	Williamson, IL	Auto/Apparel Trimmings	1958	100	305	
Sahara Coal Co.	Saline, IL	Bituminous Coal/Lignite	1900	20	600	
Peabody Coal Co./Eagle Mine	Gallatin, IL	Bituminous Coal/Lignite	1969	300	643	
Florsheim Shoe Co. Inter. Co.	Union, IL	Footwear, Except Rubber, NEC	1930	15	30	
Burkhart Manufacturing	Alexander, IL	Synthetic Rubber	1965	100	250	
Berkley & Co.	Olekinson, IA	Sporting/Athletic Goods, NEC	Refused	Refused	Refused	

NOTE

[a]Developments that do not satisfy the "distance" criterion are not included in this list.

SOURCE

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The employment pattern of new case studies is of importance because it defines the initial scope of employment when the operations began and the employment growth of the industrial project. Since the Crandon Project is estimated to employ about 900 workers, we do not consider cases where the development initially employed less than 800 workers unless employment grew beyond 800 workers within a four-year period after initial development. We obtain information on the project employment criteria through telephone interviews. A list of the 62 potential cases and data on time of development and employment are presented in Table 6.

On the basis of all the data included in Table 6, all potential case studies are eliminated except White Pine Copper in Ontonagon County, Michigan and Sperry New Holland in Dawson County, Nebraska.

Since two (location and distance) of the four area criteria are already employed to focus the search for a new case study to a manageable number of cases (see discussion, pages 35-36), we apply the two remaining area selection criteria (population and unemployment) to the remaining case studies. Table 7 provides the unemployment and population data on Ontonagon County, Michigan and Dawson County, Nebraska. A case study scores "1" on a criterion if it meets that criterion, or scores "0" if it does not meet that criterion. The criteria are summed for each of the two cases. Table 7 indicates that White Pine Copper in Ontonagon

Table 7

AREA POPULATION AND UNEMPLOYMENT DATA AND SCORING
FOR FINAL SELECTION OF NEW CASE STUDY

	Ontonagon County, Michigan		Dawson County, Nebraska	
	Data	Score	Data	Score
Population	1950:	1	1970:	1
	10,300		19,467	
Unemployment	1950:	1	1970:	0
	County: 17%		County: 2.6%	
	State: 5.2%	___	State: 2.7%	___
Total Score		2		1

SOURCE

Research and Planning Consultants, Inc.

County, Michigan will serve as the new case study. The Dawson County unemployment rate (2.6 percent) was lower than the state unemployment rate (2.7 percent). The criterion specifies that the county unemployment rate be at least 10 percent higher than the state unemployment rate at the time the project was announced. A comparison of Ontonagon County, Michigan and Dawson County, Nebraska indicates that the Michigan case is a more valid choice than the Nebraska case. The White Pine Copper case is of a mining development which occurred in an area environmentally and economically more similar to the proposed Crandon Project development than the Sperry New Holland case in Nebraska. We will determine the project area for the White Pine Copper case study after we gather the preliminary data.

5. SELECTION OF CONTROL AREAS

Not all of the changes that occur in an area over a number of years are the result of a single variable. Many changes that occurred in the new case study area and that will occur in the local study area may stem from sources unrelated to industrialization. The research design includes selection of two control areas, one for the new case study and one for the local study area. Examining socioeconomic changes in the control areas permits differentiation of effects attributable to industrial development from those that result from broader socioeconomic influences.

SELECTION CRITERIA FOR CONTROL AREAS

To select the control areas for the new case study and the local study area, we apply five criteria. The following paragraphs define these criteria. These selection criteria are designed to enhance the usefulness of a control area as an indicator of what a similar area would have been like without a major industrial development.

Location

Because state laws determine much of the institutional environment in which a project operates, the control area should be in the same state as the project. Thus, for the Crandon Project, the control area should be in Wisconsin. The White Pine Copper Mine case study control area should be in Michigan.

Representativeness

The control area should share broad socioeconomic characteristics with the project area. It should reflect the broader economic and demographic changes that occur in the project area, but it should not be within the project's range of influence.

Industrialization

The control area for the White Pine Copper Mine case study should not have experienced industrial development during the case study period. The Crandon Project control area should not be industrialized at present and it should be unlikely to experience a major industrial development similar to the Crandon Project in the foreseeable future.

Size

The control area should be sufficiently large that no individual project is likely to greatly affect the socioeconomic characteristics of the area.

Boundaries

The control area should be defined by the boundaries of a county or group of counties. This facilitates accurate monitoring of the area at relatively low cost to company and government officials. Federal and state governments collect a great deal of information on counties. Below the county level, many of these data are available infrequently, if at all. Because we are interested in broad economic and demographic trends, there appears to be little to be gained by looking at subcounty units.

SELECTION OF A CONTROL AREA FOR THE PROPOSED CRANDON PROJECT

We begin the selection process for a control area by examining individual Wisconsin counties not in a Standard Metropolitan Statistical Area (SMSA). However, no single county or small group of counties shares enough characteristics with the local study area to make it a suitable control area. The local study area consists of parts of three counties, and each of these

three counties is very different from the others. We can find no other group of counties that corresponds closely to conditions in the local study area.

Further, we cannot identify counties not in an SMSA that are certain not to experience substantial industrialization during the next few decades. Mineral exploration in Wisconsin has only just begun. Light industrial firms continue to be attracted to smaller towns. Thus, any individual county we might select could become the location of a major mining or manufacturing activity, which would disqualify the county as a control area.

With this in mind, we use as a control area all the nonmetropolitan counties in Wisconsin (determined from 1970 census data), with the exception of Forest, Langlade, and Oneida counties (Table 8). This group of counties is a large enough base that no single development will change its character, and it is large enough to reflect broad demographic and economic trends. For conditions with different baseline statistics for the local study area and for the control area, company and government officials can monitor changes in the differences over time to compare changes in the areas. Selection of these counties satisfies the criteria that the control area be composed of a group of counties to allow direct use of state and federal statistics.

Since the statistics we are collecting on the control area are identical to those being collected for case study areas

Table 8

CRANDON PROJECT CONTROL AREA COUNTIES[a]

County	County
Adams	Marinette
Ashland	Marquette
Barron	Menominee
Bayfield	Monroe
Buffalo	Oconto
Burnett	Pepin
Clark	Pierce
Columbia	Polk
Crawford	Portage
Dodge	Price
Door	Richland
Dunn	Rock
Florence	Rusk
Fond du Lac	St. Croix
Grant	Sauk
Green	Sawyer
Green Lake	Shawano
Iowa	Taylor
Iron	Trempealeau
Jackson	Vernon
Jefferson	Vilas
Juneau	Walworth
Kewaukee	Washburn
Lafayette	Waupaca
Lincoln	Waushara
Manitowoc	Wood

NOTE

[a]Counties not included in a Bureau of the Census Standard Metropolitan Statistical Area as of 1970. Does not include Forest, Langlade, and Oneida counties.

SOURCE

Research and Planning Consultants, Inc.

(Chapter 2, Table 1), there will be an adequate base for monitoring trends. These statistics would indicate any substantial deviations from broad trends in the local study area and, thus, would alert company and government officials that a more detailed study may be necessary. As soon as the 1980 census data are released, we will compile a statistical profile of all 1970 nonmetropolitan Wisconsin counties, with the exception of the counties included in the local study area for the Crandon Project.

SELECTION OF A CONTROL AREA FOR THE NEW CASE STUDY

The same logic that dictates the selection of all nonmetropolitan Wisconsin counties as the control area for the proposed Crandon Project applies to the selection of a control area for the Ontonagon County, Michigan case study. In this case, the control area consists of all counties in the upper peninsula of Michigan that are not designated as part of the project area for the case study. We will not define a project area for the Ontonagon County study until we gather the preliminary data. At the time we designate the project area for the new case study, we will also designate the control area for that case. The data we collect for the control area will be the same as that collected for the new case study, and statistics for the control area will cover the same time period as the case study statistics.

Appendix

OUTLINE FOR CASE STUDY NARRATIVES

1. INTRODUCTION

   Objectives of the Case Study Analysis

   Similarities and Differences Between the Case Study Project Area and the Crandon Project Local Study Area

   Summary of Analyses

2. DESCRIPTION OF THE DEVELOPMENT

   Type of Development

   Development Stages
   - Construction
   - Operation

   Corporate Experience and Background

   Actual Corporate Practices for Hiring, Training, and Cooperation with Local People

   Annual Change in Labor Force Characteristics
   - Types of Jobs
   - Wages
   - Skills
   - Total Number
   - Local vs. Immigrant Workers

   Purchasing Patterns for One Year
   - Total Expenditures
   - Regional Expenditures
   - Regional Spending by Sector

   Annual Production Figures

(continued)

3. DESCRIPTION OF THE COMMUNITY AND REGION BEFORE PROJECT DEVELOPMENT, DURING CONSTRUCTION, AND FROM BEGINNING OF OPERATION TO END OF STUDY PERIOD

Population
- Size
- Net Migration
- Urban/Rural Distribution
- Sex Distribution
- Density

Labor Force
- Employment by Occupation
- Employment by Industry
- Unemployment
- Wage Rates

Housing
- Rental Units
  - Vacancy Rates
  - Available Units
  - Representative Rent Per Unit
- Nonrental Units
  - Housing Starts
  - Resales
  - Average Selling Price

Economy
- Total Number of Retail Establishments
- Total Amount of Retail Sales
- Household Income

Local Government Facilities, Services, Revenues, and Expenditures
- Types of Revenue
- Amount of Revenue by Type
- Amount of Expenditures by Type
- Bond Indebtedness
- Public Facilities and Services by Type

Sociocultural Characteristics
- Number of Crimes, Divorces, and Suicides
- Schooling
- Effects on Ethnic Minorities

4. SUMMARY AND CONCLUSIONS: SIGNIFICANT CHANGES THAT OCCURRED FROM PREDEVELOPMENT BASELINE TO PRESENT

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