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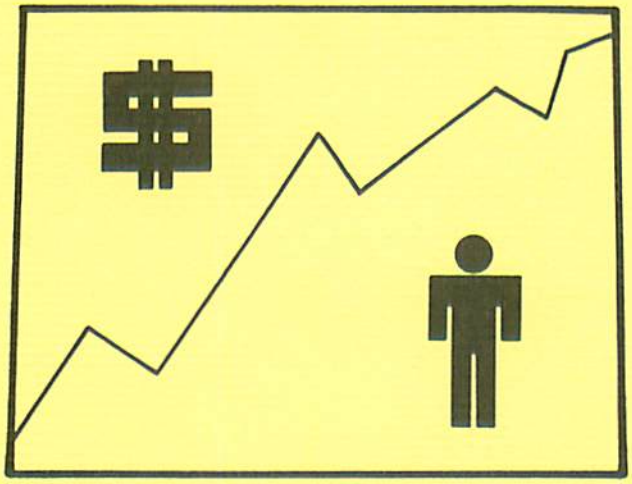
Agricultural Economics Miscellaneous Report No. 63 MAY 1983

Expansion and Adaptation of the North Dakota Economic-Demographic Assessment Model (NEDAM) for Wyoming:

Technical Description



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FOREWORD

The work upon which this report is based was supported in part by funds from the Office of Nuclear Waste Isolation (ONWI), U.S. Department of Energy through the Western Rural Development Center (WRDC). The document, however, represents the views of the authors only and not necessarily those of the U.S. Department of Energy, the U.S. Department of Agriculture, or the Western Rural Development Center.

The purpose of this research was to test the adaptability of socioeconomic impact assessment models to alternative geographic settings. This report describes the data sources and procedures employed in adapting an existing North Dakota modeling framework for use in Wyoming. A companion document (Agricultural Economics Report No. 158) describes the logic, structure, data bases, and operational procedures of the North Dakota model. The intent of this report is to describe the data and procedures used for adaptation of NEDAM to Wyoming. User procedures are explained in the companion document (Agricultural Economics Report No. 158) and are not replicated in this report. Those wanting more information about "hands on" operation of the model should see the "User Procedures" section of that report.

The authors wish to express their appreciation to several individuals who made significant contributions to the successful completion of the study. Dr. James Finley, Project Manager for the Office of Nuclear Waste Isolation, and Dr. Steve Murdock, Project Director of the ONWI-WRDC project, were unfailing sources of encouragement throughout the course of the effort. Mr. John Goodier, Chief of Mineral Development, Wyoming State Department of Economic Development and Planning, made an invaluable contribution to the effort, particularly through his astute advice concerning data sources. Within the Department of Agricultural Economics of North Dakota State University, we gratefully acknowledge the contributions of Ms. Lori Cullen for her skillful and expeditious typing of the reports and Ms. Carol VavRosky for preparing the graphic materials. Finally, we express our appreciation to the state and local government officials and energy industry representatives who provided information essential to the analysis.

As always, our gratefulness to these individuals does not implicate them for any remaining errors or ommissions.

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Expansion and Adaptation of the North Dakota Economic-Demographic Assessment Model (NEDAM) for Wyoming:

Technical Description

by

Randal C. Coon, Carlena F. Vocke, Robert A. Chase, Brenda L. Ekstrom, William Ransom-Nelson, Richard W. Rathge, Thor A. Hertsgaard, F. Larry Leistritz, Rebecca J. Vuchetich, Babu Ranganathan

Introduction

Recent increases in the development of natural resources such as coal extraction and conversion, along with projections of future development and utilization of Wyoming resources, have created concerns regarding the associated economic and social effects on rural areas. Declines in uranium and oil production the last two years have created similar concerns about negative impacts if this trend continues or earlier levels of production are not resumed. Federal, state, and local policy makers are requesting (and requiring) an increasing number of assessments of these social and economic impacts. In response, a number of socioeconomic impact assessment models have been developed to aid in the evaluation of public and private policies, to estimate the impacts of specific energy development projects, and to lend assistance in guiding local and regional planning.

The objective of this report is to describe the modified structure and data base of an existing computerized socioeconomic impact assessment model (North Dakota Economic-Demographic Assessment Model or NEDAM)[1] for adaptation to Wyoming. NEDAM was originally designed to provide estimates of economic, demographic, and fiscal changes at both the regional and local levels

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[1]For a complete description of NEDAM, see Leistritz, F. Larry, William Ransom-Nelson, Richard W. Rathge, Randal C. Coon, Robert A. Chase, Thor A. Hertsgaard, Steve H. Murdock, Rakesh Sharma, and Pai-Sung Yang, North Dakota Economic-Demographic Assessment Model (NEDAM): Technical Description, Agricultural Economics Report No. 158, Department of Agricultural Economics, North Dakota Agricultural Experiment Station, North Dakota State University, Fargo, September 1982.

resulting from alternative scenarios of energy resource use and development in North Dakota. NEDAM has successfully been adapted for Montana and used for economic impact assessment.[2] The adapted version of the model for Wyoming projects personal income at the multi-county regional level and estimates employment, population, and public sector costs and revenues at county and community levels. These projections are made on an annual basis for the period 1981 through 2005.

Study Area

The geographic scope of the project encompasses all 23 counties in Wyoming (Figure 1). Wyoming is bounded by Idaho to the west, Utah to the southwest, Colorado to the south, Nebraska and South Dakota to the east, and Montana to the north. The state's total land area is approximately 98,000 square miles, of which about 49 percent belongs to the federal government.[3] The composition of federal land holdings varies from an Indian reservation and two national parks to extensive holdings of the U.S. Forest Service and the Bureau of Land Management.

The 1980 census population of Wyoming was 470,816 inhabitants, and the 1981 adjusted gross personal income was $5.794 billion.[4] Natural resource-based

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[2]Chase, Robert A., Randal C. Coon, Connie L. Chase, Carlena F. Vocke, Rebecca J. Vuchetich, F. Larry Leistritz, Thor A. Hertsgaard, William Ransom-Nelson, Steve H. Murdock, Pai-Sung Yang, and Rakesh Sharma, Expansion and Adaptation of the North Dakota Economic-Demographic Assessment Model (NEDAM) for Montana: Technical Description, Agricultural Economics Miscellaneous Report No. 61, Department of Agricultural Economics, North Dakota Agricultural Experiment Station, North Dakota State University, Fargo, December 1982.

[3]U.S. Bureau of Land Management, Public Land Statistics, U.S. Department of Interior, U.S. Government Printing Office, Washington, D.C., 1981.

[4]Bureau of the Census, 1980 Census of Population and Housing--Wyoming, PHC80-V-52, U.S. Department of Commerce, U.S. Government Printing Office, Washington, D.C., April 1981; and Bureau of Economic Analysis, "Survey of Current Business," Volume 62, Number 4, U.S. Department of Commerce, U.S. Government Printing Office, Washington, D.C., April 1982.

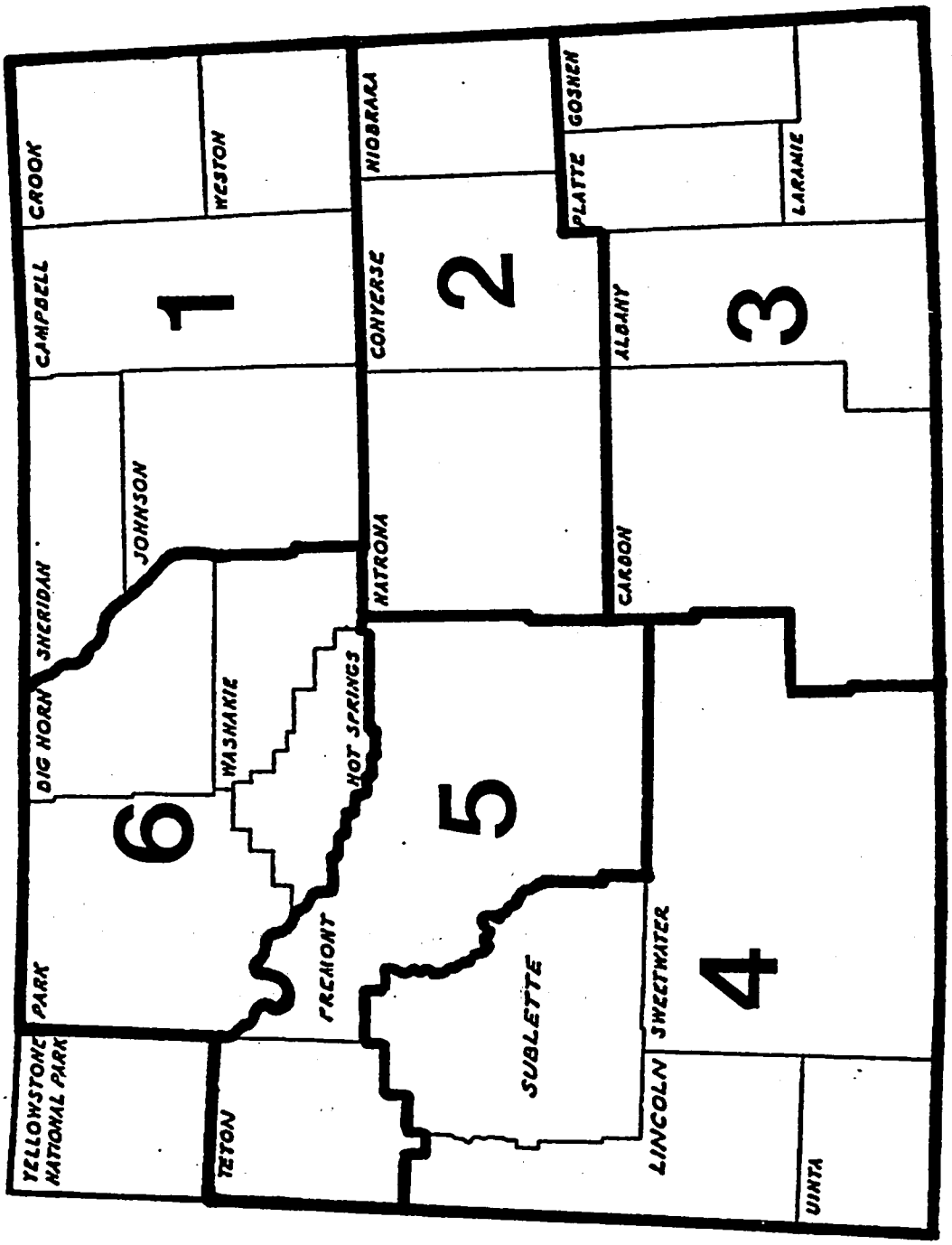

Figure 1. The Six Functional Economic Regions in Wyoming

industries (agriculture, mining, lumber, and tourism) form the state's economic backbone.

Problem Statement

In recent years, the United States has increasingly turned toward developing its vast energy resources to decrease its dependence upon energy imports. This trend has spawned marked increases in extraction activity within the West, including Wyoming. As a result, the energy resource base in Wyoming has become a focal point in regional and extraregional resource conflict. Questions relating to the magnitude, manner, and effects of energy exploitation have been raised. Consequently, a detailed socioeconomic description of the state as it currently exists is needed to answer these questions. An analytical framework must be developed which is capable of assessing the direct and secondary socioeconomic impacts associated with alternative scenarios of energy development as proposed by various public and private entities in Wyoming. Likewise, similar questions and analytical requirements are evident in connection with the proposed development of minerals and other resources in Wyoming.

In response, a socioeconomic assessment model has been developed to meet these needs in Wyoming. It is a modified version of NEDAM, a model initially developed in 1976 to provide comprehensive information and projections of the economic and demographic effects of various existing and anticipated energy resource developments for state and local policy makers in North Dakota. This computerized, user-interactive model has the capability to make baseline and single- or multiple-project impact forecasts for any designated site in North Dakota. Though the basic structure of NEDAM remains essentially unchanged, model transfer necessitated extensive modification of the economic, demographic, and fiscal/service components.

The development of energy resources has prompted creation of a number of computerized socioeconomic assessment models such as NEDAM.[5] While the number of assessment models has dramatically increased, few attempts have been made to adapt such models to settings other than those for which they were originally designed. Yet the need for such transfer and adaptation efforts is all too apparent, given the growing expense of developing an assessment model. In addition to savings in time and money, other advantages of model transfer and adaptation include the opportunity to expand and refine a model's structure and capabilities. Such refinements are seldom possible during initial model development. Given the number of existing models, such adaptations may well be more important than building additional assessment models.

Since all assessment models are developed for specific geographic areas, a successful adaptation effort will require incorporation and, where appropriate, modification to the unique characteristics (e.g., public revenue and expenditure patterns) of the particular study area. The processes involved in adapting a modeling system may vary from simply the alteration of its data base (i.e., to include data unique to the area of interest) to substantial and complex changes in its computational structure.[6] An example of a successful

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[5]For a review of selected impact assessment models, see Murdock, Steve H. and F. Larry Leistritz, "Selecting Socioeconomic Assessment Models: A Discussion of Criteria and Selected Models," Journal of Environmental Management, Vol. 10, 1980, pp. 241-252; Leistritz, F. Larry and Steve H. Murdock, The Socioeconomic Impact of Resource Development: Methods for Assessment, Westview Press, Boulder, Colorado, 1981; and Leistritz, F. Larry, Steve H. Murdock, and Robert A. Chase, "Socioeconomic Impact Assessment Models: Review and Evaluation," Impact Assessment Bulletin, Vol. 1, No. 4, 1982, pp. 35-49.

[6]For a description of the major steps in adapting a model and considerations for successful transfer, see House, Peter W. and John McLeod, Large-Scale Models for Policy Evaluation, John Wiley and Sons, New York, 1977; Murdock, Steve H. and F. Larry Leistritz, "Computerized Socioeconomic Assessment Models: Selection, Development, and Adaptation," (unpublished manuscript), Department of Rural Sociology, Texas A&M University, College Station, 1980; and Chase, Robert A. and F. Larry Leistritz, "A Case Study in Impact Assessment Model Adaptation," paper presented at the Mid-Continent Regional Science Association meeting, Vail, Colorado, June 1982.

transfer and adaptation effort is the Texas Assessment Modeling System (TAMS). Adapted from an earlier version of NEDAM, TAMS essentially retains the basic structure with the exception of extensive modification of the economic subcomponent, since the input-output model incorporated within the North Dakota version did not reflect the economic structure of eastern Texas. The other subcomponents in the model (i.e., demographic, fiscal, and service) were left relatively intact within the TAMS version. The adaptation of the NEDAM version to the Texas environment began in the fall of 1978, and the model became fully operational a year later. The relatively long time period for adaptation was, in large part, a result of extensive development of the Texas input-output model for use within the modeling system. Since its inception, the TAMS version has been widely used by state and local agencies for impact planning purposes.[7]

NEDAM also has been adapted for use in Montana. This adaptation involved a much shorter period of time than the TAMS effort because a new input-output model was not developed. The North Dakota input-output model was augmented with secondary data to replicate the Montana economy. After the data base for Montana was gathered, the model was basically operational because the major subcomponents were relatively unchanged. The Montana extension of NEDAM has been used extensively for impact analysis of coal extraction and conversion projects.[8]

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[7]For a more complete discussion of the TAMS adaptation experience, see Murdock, Steve H., Lonnie L. Jones, F. Larry Leistritz, and Donald R. Andrews, "The Texas Assessment Modeling System (TAMS): A Case Study in Model Adaptation," Paper presented at the Conference on Computer Models and Forecasting Growth and Development, Jasper, Alberta, April 1980.

[8]For a complete description of the adaptation of NEDAM to Montana, see Chase, Robert A., et al., 1982, op. cit.

Outline of the Report

The remainder of this report consists of (1) a description of the methodology for the various data bases incorporated within the NEDAM extension and adaptation to Wyoming and a presentation of results from the adapted version, and (2) a concluding discussion on validation of the adapted version of the model.

In addition to the main text of the report, several appendices are provided. These appendices include (1) a discussion of data sources and procedures for the economic module; (2) a number of input-output (final demands, gross business volumes), employment, and productivity ratio tables; and (3) samples of the scenario specification procedure and output reports.

Methodology

The adapted version of NEDAM, designed to cover the 23 counties of Wyoming, has the capability to incorporate both energy- and nonenergy-related developments and allows for the evaluation of expansion, as well as decline, in the economic base. The user may select any one of the six designated functional regions or a group of counties (up to 15 counties) as the basis for model output.

The adapted Wyoming version provides for both baseline and impact projections for the period between 1981 and 2005. Baseline projections produced by the model indicate the expected response of economic and demographic factors in a designated region if the trends of the 1960s and 1970s were to continue to 2005. Given the historical trends of declining farm and ranch numbers and rural population, the baseline projections represent limited economic development opportunities for many areas in the region. These estimates provide the necessary background against which the impacts of resource developments are assessed.

The projections provided by the adapted model allow for the assessment of various socioeconomic impacts of single and multiple developments at alternative sites anywhere in the state. Essentially, the starting points for these projections are baseline population and economic data from the 1960s and 1970s. All changes from this initial baseline estimate for the years 1981 through 2005 are predicated on the expected expenditure and employment levels resulting from various developments.

The methodology used in expanding the NEDAM into Wyoming involves a number of steps:

1. Definition of the study area,
2. Description of the economic module,
3. Description of the demographic module,
4. Description of the residential allocation module, and
5. Modification of the fiscal impact model parameters.

These methods along with their results are described in the following sections.

Definition of the Study Area

Adaptation of the NEDAM involved applying the methodology and collecting the appropriate data for a defined area. The study area is defined as all 23 counties in Wyoming. Since model reports are furnished at the regional, county, and municipality levels, two major tasks had to be completed:

1. Selection of counties and communities for model inclusion, and
2. Disaggregation of the study area into functional economic regions.

The sources consulted and methods used in defining the study area are described below.

Community Selection

Essentially, the communities selected for model inclusion were either incorporated municipalities having a 1980 population greater than 300 people

or unincorporated municipalities with a 1980 count of at least 500 people. A total of 96 Wyoming communities were included in the extended model. In addition, 46 border communities in South Dakota, Nebraska, Colorado, Utah, Idaho, and Montana were included to account for interstate spillover effects of projects located close to (either side of) the border. Table 1 (and Appendix B, Table 1) lists both the counties and the communities included in the model.

Functional Economic Regions

In the NEDAM adaptation, the user may select either a group of counties or a designated region. The designated regions have been defined as functional economic areas (i.e., retail/wholesale trade areas) where each region is served by a major trade center. After consulting the available sources,[9] the study area was disaggregated into six regions (Table 2). The boundaries of these regions were drawn along county boundaries to conform with available sources of statistical data. Figure 1 shows the study area as divided into six functional economic regions.

Description of the Economic Module

The economic module in the adapted version consists of six major components:

1. Economic Sector Delineation,
2. Input-Output (I-O) Technical and Interdependence Coefficients,
3. Baseline Economic Projections,

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[9]See Rand-McNally, 1982 Commercial Atlas and Marketing Guide, 113th Edition, Chicago, Illinois, 1982; Chalmers, J. A., E. J. Anderson, T. Beckhelm, and W. Hannigan, "An Empirical Model of Spatial Interaction in Sparsely Populated Regions," Paper presented at 24th Annual Meeting of Regional Science Association, Philadelphia, November 1977; and Bureau of Economic Analysis and U.S. Department of Agriculture, 1972 OBERS Projections: Economic Activity in the United States, Department of Commerce and Economic Research Service, U.S. Government Printing Office, Washington, D.C., 1972.

TABLE 1. COUNTIES AND COMMUNITIES FOR MODEL INCLUSION

County	Community
Albany	Laramie, Rock River
Big Horn	Basin, Byron, Cowley, Deaver, Frannie, Greybull, Lovell, Manderson
Campbell	Gillette, Wright*
Carbon	Baggs, Dixon, Elk Mountain, Encampment, Hanna, Medicine Bow, Rawlins, Riverside, Saratoga, Sinclair
Converse	Douglas, Glenrock
Crook	Hulett, Moorcroft, Sundance
Fremont	Dubois, Hudson, Jeffrey City*, Lander, Pavillion, Riverton, Shoshoni
Goshen	Fort Laramie, LaGrange, Lingle, Torrington, Yoder
Hot Springs	East Thermopolis, Kirby, Thermopolis
Johnson	Buffalo, Kaycee
Laramie	Albin, Burns, Carpenter*, Cheyenne, Federal*, Horse Creek*, Pine Bluffs
Lincoln	Afton, Cokeville, Diamondville, Kemmerer, LaBarge, Thayne
Natrona	Alcova*, Casper, Edgerton, Evansville, Midwest, Mills
Niobrara	Lusk, Lance Creek*, Manville
Park	Cody, Meeteetse, Powell
Platte	Chugwater, Glendo, Guernsey, Hartville, Wheatland
Sheridan	Clearmont, Dayton, Ranchester, Sheridan
Sublette	Big Piney, Marbleton, Pinedale
Sweetwater	Eden*, Granger, Green River, Rock Springs, South Superior, Wamsutter
Teton	Jackson
Uinta	Evanston, Lyman, Mountain View

- continued -

TABLE 1. COUNTIES AND COMMUNITIES FOR MODEL INCLUSION (CONTINUED)

County	Community
Washakie	Ten Sleep, Worland
Weston	Newcastle, Osage*, Upton

BORDER COMMUNITIES

State	Community
South Dakota	Belle Forche, Custer, Edgemont, Lead, Rapid City, Spearfish
Nebraska	Crawford, Gering, Harrison, Kimball, Mitchell, Scottsbluff
Colorado	Boulder, Craig, Denver, Fort Collins, Fort Morgan, Greeley, Longmont, Loveland, Steamboat Springs, Walden
Utah	Coalville, Garden City, Logan, Ogden, Salt Lake City, Vernal, Woodruff
Idaho	Idaho Falls, Montpelier, Rexburg, St. Anthony, Soda Springs, Swan Valley, Tetonia, Victor
Montana	Billings, Bozeman, Broadus, Decker, Hardin, Laurel, Livingston, Red Lodge, West Yellowstone

*Unincorporated municipality as reported by 1980 census data.

4. Productivity Ratios,
5. County/Municipal Employment Allocators, and
6. Project Specific Economic Parameters.

Data sources and methods used in the preparation of each of these components, and the results, are presented below.

Economic Sector Delineation

NEDAM uses an input-output model to estimate economic activities associated with projected levels of the historic economic base with alternative scenarios of resource development for the area. Input-output analysis

TABLE 2. FUNCTIONAL ECONOMIC REGIONS FOR WYOMING ECONOMIC-DEMOGRAPHIC MODEL

Region 1: Gillette-Sheridan		
Campbell	Johnson	Weston
Crook	Sheridan	
Region 2: Casper		
Converse	Natrona	Niobrara
Region 3: Cheyenne		
Albany	Goshen	Platte
Carbon	Laramie	
Region 4: Rock Springs		
Lincoln	Sweetwater	
Sublette	Uinta	
Region 5: Riverton		
Fremont	Teton	
Region 6: Worland		
Big Horn	Park	
Hot Springs	Washakie	

essentially tabulates and describes the linkages or interdependencies between various industrial groups within an economy. As such, the model requires the separation of the economy into these various groups called "sectors." The general framework of the model structures economic activity along two major divisions--suppliers and purchasers. Though these divisions are further subdivided into intermediate (processing) and primary (final payments) sectors and intermediate (processing) and final (final demand) purchasers, a further sector disaggregation is required.

The ideal sector delineation would allow unique recognition of supplier groups, each of which produces a homogeneous good. This ideal, however, is not feasible given the constraints of time, financing, and data. Hence, sector selection was determined to a large extent by the objectives of the study. Since the purpose was primarily to determine the impacts of resource development, most economic sectors such as retail trade and business services did not appear to require detailed disaggregation.

The input-output model used in the adapted version includes the 17 economic sectors of the North Dakota version along with three additional sectors: lumber and associated products, metal mining, and metal processing. The final sector delineations selected for this study are presented in Table 3. A description of the various sectors, their data sources, and their construction is provided in Appendix A.

I-O Technical and Interdependence Coefficients

The description and analysis of the economy is based upon three components: transactions table, technical coefficients (direct requirements) table, and interdependence coefficients (direct and indirect requirements) table. Once data describing the commodities' flows between sectors are collected and tabulated, the technical coefficients can be easily derived. The difficulty, however, is preparing a transactions table that accurately describes the interdependencies among the economic sectors. Since the time and expense required to prepare the transactions table based on primary data are considerable, technical coefficients available from the North Dakota version and the Northwestern Colorado Input-Output Model[10] were used to

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[10]See Leistritz, et al., 1982, op. cit.; and Gray, S. L., J. R. McKean, and J. C. Weber, The Economy of Northwestern Colorado: Description and Analysis, Technical Report No. 25, Colorado Water Resources Research Institute, Colorado State University, Fort Collins, 1981.

TABLE 3. ECONOMIC SECTORS OF INPUT-OUTPUT MODEL AND ASSOCIATED STANDARD INDUSTRIAL CLASSIFICATION CODES FOR WYOMING EXTENSION OF NEDAM

Economic Sector	SIC Code[a]
1. Agriculture, Livestock	Group 013 - Livestock
2. Agriculture, Crops	All of Major Group 01 - Agricultural Production, Except Group 013 - Livestock
3. Metal Mining	Major Group 10 - Metal Mining
4. Coal Mining	Major Group 12 - Bituminous Coal and Lignite Mining
5. Petroleum and Natural Gas Exploration and Extraction	Major Group 13 - Crude Petroleum and Natural Gas
6. Nonmetallic Mining	Major Group 14 - Mining and Quarrying of Nonmetallic Metal, Except Fuels
7. Contract Construction	Division C - Contract Construction (Major Groups 15, 16, and 17)
8. Lumber and Associated Products	Major Group 08 - Forestry, Major Group 24 - Lumber and Wood Products, Except Furniture, and Major Group 26 - Paper and Allied Products
9. Agricultural Processing and Miscellaneous Manufacturing	Major Group 50 - Wholesale Trade, Major Group 20 - Food and Kindred Products Manufacturing
10. Petroleum Refining	Major Group 29 - Petroleum Refining and Related Industries
11. Metal Processing	Major Group 33 - Primary Metal Manufacturing
12. Transportation	All of Division E - Transportation, Communications, Electric, Gas, and Sanitary Services, Except Major Groups 48 and 49
13. Communications and Utilities	Major Group 48 - Communication, and Major Group 49 - Electric, Gas, and Sanitary Services, Except Industry No. 4911
14. Thermal - Electric Power Generation	Industry Number 4911 - Electric Companies and Systems

- Continued -

TABLE 3. ECONOMIC SECTORS OF INPUT-OUTPUT MODEL AND ASSOCIATED STANDARD INDUSTRIAL CLASSIFICATION CODES FOR WYOMING EXTENSION OF NEDAM (CONTINUED)

Economic Sector	SIC Code[a]
15. Retail Trade	All of Division F - Wholesale and Retail Trade, Except Major Group 50 - Wholesale Trade
16. Finance, Insurance, and Real Estate	Division G - Finance, Insurance, and Real Estate
17. Business and Personal Services	All of Division H - Services, Except Major Groups 80, 81, 82, 86, and 89
18. Professional and Social Services	Major Group 80 - Medical and Other Health Services, Major Group 81 - Legal Services, Major Group 82 - Educational Services, Major Group 86 - Nonprofit Membership Organizations, and Major Group 89 - Miscellaneous Services
19. Government	Division I - Government
20. Households	Not Applicable

[a]Executive Office of the President/Bureau of the Budget, Standard Industrial Classification Manual, 1967, U.S. Government Printing Office, Washington, D.C., 1967.

approximate the interindustry relationships in Wyoming. The similarity of the economies of Wyoming and western North Dakota suggests that such a transfer is feasible. For the Wyoming regions, where sectors present in this area are not found in North Dakota (i.e., metallic mining, metal processing, and lumber), an existing I-O model from Colorado was selected as an appropriate source. The technical coefficients developed for Wyoming are provided in Table 4.

The technical coefficients matrix was subsequently used to derive interdependence coefficients which indicate the total (direct and indirect) input requirements per unit of output. The interdependence coefficients matrix

TABLE 4. INPUT-OUTPUT TECHNICAL COEFFICIENTS FOR 20-SECTOR MODEL, WYOMING ECONOMY

Sector	(1) Ag, Lvstk	(2) Ag, Crops	(3) Metal Mining	(4) Coal Mining	(5) Pet/NG Exp/Ext	(6) Nonmetallic Mining	(7) Constr	(8) Lumber	(9) Ag Proc & Misc Mfg	(10) Pet Refining
(1) Ag, Livestock	.0937	.0019	.0000	.0000	.0000	.0000	.0000	.0000	.0742	.0000
(2) Ag, Crops	.1534	.0210	.0000	.0000	.0000	.0001	.0000	.0000	.3476	.0000
(3) Metal Mining	.0000	.0000	.1176	.0000	.0000	.0000	.0000	.0000	.0000	.0000
(4) Coal Mining	.0000	.0000	.0004	.0000	.0003	.0000	.0000	.0000	.0000	.0000
(5) Pet/NG Exp/Ext	.0000	.0000	.0000	.0000	.0893	.0000	.0000	.0000	.0000	.7492
(6) Nonmetallic Mining	.0024	.0020	.0012	.0001	.0005	.0348	.0265	.0000	.0006	.0000
(7) Construction	.0014	.0175	.0005	.0108	.0857	.0000	.0129	.0438	.0010	.0035
(8) Lumber	.0000	.0000	.0342	.0000	.0000	.0000	.0000	.0116	.0000	.0000
(9) Ag Proc & Misc Mfg	.2737	.0693	.0017	.0241	.0000	.0000	.0000	.0080	.3671	.0000
(10) Pet Refining	.0000	.0000	.0000	.0168	.0000	.0000	.0000	.0000	.0000	.0000
(11) Metal Processing	.0000	.0000	.0084	.0000	.0000	.0000	.0000	.0005	.0000	.0000
(12) Transportation	.0042	.0018	.0556	.0031	.0137	.0208	.0051	.0203	.0024	.0033
(13) Comm & Pub Utilities	.0068	.0035	.0246	.0215	.0230	.0864	.0119	.0236	.0059	.0021
(14) Electric Generation	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
(15) Retail Trade	.0601	.2920	.0013	.0642	.0125	.0965	.1016	.0121	.0090	.0021
(16) Fin, Ins, Real Estate	.0115	.0525	.0122	.0017	.0009	.0170	.0147	.0215	.0044	.0005
(17) Bus & Pers Service	.0028	.0253	.0004	.0018	.0004	.0079	.0036	.1249	.0010	.0000
(18) Prof & Soc Service	.0027	.0019	.0029	.0066	.0004	.0019	.0012	.0334	.0005	.0002
(19) Government	.0100	.0202	.0094	.0014	.0004	.0159	.0055	.0049	.0029	.0028
(20) Households	.3416	.4315	.2295	.3738	.1309	.4259	.3239	.2134	.0431	.0302

- continued -

TABLE 4. INPUT-OUTPUT TECHNICAL COEFFICIENTS FOR 20-SECTOR MODEL, WYOMING ECONOMY (CONTINUED)

Sector	(11) Metal Proc	(12) Trans	(13) Comm & Pub Util	(14) Elec Gen	(15) Retail Trade	(16) FIRE	(17) Bus & Pers Service	(18) Prof & Soc Serv	(19) Govt	(20) Households
(1) Ag, Livestock	.0000	.0000	.0000	.0000	.0575	.0000	.0000	.0005	.0000	.0097
(2) Ag, Crops	.0000	.0000	.0000	.0000	.0013	.0010	.0000	.0000	.0000	.0001
(3) Metal Mining	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
(4) Coal Mining	.0001	.0000	.0000	.1582	.0000	.0000	.0000	.0000	.0000	.0000
(5) Pet/NG Exp/Ext	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
(6) Nonmetallic Mining	.0001	.0058	.0007	.0000	.0003	.0002	.0011	.0005	.0000	.0016
(7) Construction	.0000	.0013	.0174	.0058	.0093	.0016	.0103	.0147	.0000	.0498
(8) Lumber	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
(9) Ag Proc & Misc Mfg	.0102	.0000	.0000	.0339	.0002	.0201	.0000	.0010	.0000	.0016
(10) Pet Refining	.0000	.0000	.0000	.0075	.0000	.0000	.0000	.0000	.0000	.0000
(11) Metal Processing	.0130	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
(12) Transportation	.0252	.0014	.0077	.0009	.0067	.0033	.0059	.0019	.0000	.0009
(13) Comm & Pub Utilities	.0244	.0224	.0414	.0024	.0207	.0434	.0536	.0394	.0000	.0443
(14) Electric Generatior	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
(15) Retail Trade	.0021	.1506	.0384	.0079	.0582	.0808	.0911	.1420	.0000	.4129
(16) Fin, Ins, Real Estate	.0094	.0314	.0240	.0513	.0097	.0077	.0267	.0223	.0000	.0961
(17) Bus & Pers Service	.0009	.0134	.0050	.0018	.0019	.0278	.0209	.0030	.0000	.0328
(18) Prof & Soc Service	.0054	.0014	.0019	.0033	.0015	.0049	.0037	.0347	.0000	.0593
(19) Government	.0187	.1992	.0398	.0135	.0065	.0184	.0216	.0104	.0000	.0578
(20) Households	.1738	.4210	.4478	.1207	.1780	.6956	.3697	.5654	.0000	.0682

by definition is $(I-A)^{-1}$, where A is the matrix of technical coefficients and I is an identity matrix. Due to its expansion from 17 to 20 sectors (requiring a reinverting of the technical coefficients matrix), the Wyoming version has different interdependence coefficients for comparable sectors than the North Dakota version (Table 5).

Baseline Economic Projection Procedures

The economic module of the adapted version determines both baseline and impact projections. Baseline projections indicate the level of economic activity (measured by employment, personal income, and sales to final demand) associated with a continuation of current trends in the region's basic sectors. Baseline estimates constitute projections of future economic conditions likely to prevail in the area if no major resource development projects are initiated or closed. These projections are the essential base upon which the changes in economic activity associated with alternative scenarios of resource development are superimposed.

The general procedures for developing baseline economic projections involved projecting historic sales to final demand for the basic economic sectors through the year 2005. The I-O technical coefficients were applied to these final demand projections to obtain estimates of total output (gross business volume) for each sector for the respective years. Projected gross business volumes for each sector were divided by the projected productivity ratios for their respective sectors for each year to obtain estimated employment. In the final step, regional employment was allocated to counties and municipalities based on each entity's projected share of regional employment.

Baseline final demand projections were developed by first estimating the baseline sales to final demand for each sector for the period 1960 to 1980. The economic baseline for the study region was defined as the export sales of that

TABLE 5. INPUT-OUTPUT INTERDEPENDENCE COEFFICIENTS FOR 20-SECTOR MODEL, WYOMING ECONOMY

Sector	(1) Ag, Lvstk	(2) Ag, Crops	(3) Metal Mining	(4) Coal Mining	(5) Pet/NG Exp/Ext	(6) Nonmetallic Mining	(7) Constr	(8) Lumber	(9) Ag Proc & Misc Mfg	(10) Pet Refining
(1) Ag, Livestock	1.2072	.0774	.0244	.0376	.0159	.0445	.0343	.0287	.1911	.0145
(2) Ag, Crops	.3938	1.0922	.0112	.0285	.0063	.0176	.0134	.0162	.6488	.0057
(3) Metal Mining	.0000	.0000	1.1333	.0000	.0000	.0000	.0000	.0000	.0000	.0000
(4) Coal Mining	.0000	.0000	.0005	1.0000	.0003	.0000	.0000	.0000	.0000	.0002
(5) Pet/NG Exp/Ext	.0000	.0000	.0000	.0138	1.0981	.0000	.0000	.0000	.0000	.8227
(6) Nonmetallic Mining	.0084	.0069	.0039	.0032	.0045	1.0396	.0303	.0038	.0063	.0037
(7) Construction	.0722	.0794	.0339	.0526	.1148	.0521	1.0501	.0807	.0619	.0929
(8) Lumber	.0000	.0000	.0392	.0000	.0000	.0000	.0000	1.0117	.0000	.0000
(9) Ag Proc & Misc Mfg	.5730	.1612	.0193	.0618	.0097	.0272	.0207	.0315	1.7402	.0089
(10) Pet Refining	.0000	.0000	.0000	.0168	.0000	.0000	.0000	.0000	.0000	1.0000
(11) Metal Processing	.0000	.0000	.0097	.0000	.0000	.0000	.0000	.0005	.0000	.0000
(12) Transportation	.0151	.0113	.0679	.0084	.0180	.0284	.0105	.0258	.0128	.0172
(13) Comm & Pub Utilities	.0921	.0836	.0696	.0713	.0510	.1557	.0605	.0756	.0767	.0444
(14) Electric Generation	.0000	.0000	.0001	.0000	.0000	.0000	.0000	.0000	.0000	.0000
(15) Retail Trade	.7072	.8130	.2701	.3996	.1839	.5235	.4101	.3156	.6115	.1675
(16) Fin, Ins, Real Estate	.1526	.1677	.0753	.0771	.0388	.1140	.0837	.0903	.1322	.0358
(17) Bus & Pers Service	.0562	.0684	.0277	.0289	.0139	.0430	.0287	.1528	.0514	.0127
(18) Prof & Soc Service	.0711	.0644	.0384	.0493	.0210	.0560	.0402	.0714	.0531	.0195
(19) Government	.0987	.0957	.0626	.0511	.0280	.0853	.0519	.0545	.0796	.0285
(20) Households	1.0459	.9643	.5249	.6666	.3206	.8428	.6091	.5608	.7862	.2951
Gross Receipts Multiplier	4.4935	3.6855	2.4119	2.5666	1.9248	3.0297	2.4435	2.5199	4.4518	2.5693

- continued -

TABLE 5. INPUT-OUTPUT INTERDEPENDENCE COEFFICIENTS FOR 20-SECTOR MODEL, WYOMING ECONOMY (CONTINUED)

Sector	(11) Metal Proc	(12) Trans	(13) Comm & Pub Util	(14) Elec Gen	(15) Retail Trade	(16) FIRE	(17) Bus & Pers Service	(18) Prof & Soc Serv	(19) Govt	(20) Households
(1) Ag, Livestock	.0171	.0455	.0379	.0251	.0889	.0617	.0384	.0571	.0000	.0674
(2) Ag, Crops	.0128	.0179	.0152	.0321	.0318	.0368	.0152	.0230	.0000	.0267
(3) Metal Mining	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
(4) Coal Mining	.0001	.0000	.0000	.1582	.0000	.0000	.0000	.0000	.0000	.0000
(5) Pet/NG Exp/Ext	.0000	.0000	.0000	.0084	.0000	.0000	.0000	.0000	.0000	.0000
(6) Nonmetallic Mining	.0016	.0092	.0044	.0019	.0025	.0050	.0044	.0051	.0000	.0058
(7) Construction	.0207	.0496	.0653	.0327	.0348	.0740	.0546	.0787	.0000	.0902
(8) Lumber	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
(9) Ag Proc & Misc Mfg	.0276	.0277	.0239	.0782	.0452	.0704	.0237	.0363	.0000	.0417
(10) Pet Refining	.0000	.0000	.0000	.0102	.0000	.0000	.0000	.0000	.0000	.0000
(11) Metal Processing	1.0132	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
(12) Transportation	.0280	1.0079	.0135	.0048	.0104	.0120	.0118	.0100	.0000	.0093
(13) Comm & Pub Utilities	.0509	.0840	1.1006	.0378	.0529	.1322	.1104	.1192	.0000	.1056
(14) Electric Generation	.0000	.0000	.0000	1.0000	.0000	.0000	.0000	.0000	.0000	.0000
(15) Retail Trade	.1754	.5476	.4318	.2268	1.2735	.6765	.4526	.6669	.0000	.7449
(16) Fin, Ins, Real Estate	.0487	.1205	.1129	.0978	.0578	1.1424	.1085	.1401	.0000	.1681
(17) Bus & Pers Service	.0153	.0461	.0375	.0201	.0194	.0766	1.0509	.0455	.0000	.0605
(18) Prof & Soc Service	.0274	.0519	.0527	.0301	.0276	.0816	.0497	1.1026	.0000	.0982
(19) Government	.0495	.2583	.0999	.0445	.0395	.1071	.0774	.0881	1.0000	.1080
(20) Households	.3401	.7878	.7953	.3974	.4036	.1219	.7161	1.0438	.0000	1.5526
Gross Receipts Multiplier	1.8284	3.0540	2.7909	2.2061	2.0879	3.6782	2.7137	3.4164	1.0000	3.0790

region's basic producing sectors to the "rest-of-the-world" without any major new resource development projects. The major components of the area's sales to final demand were sales by the agricultural (both crops and livestock), mining, and manufacturing sectors, plus federal government outlays and tourist expenditures. Historical estimates of sales to final demand were developed using data from secondary sources (see Appendix A) and techniques similar to those utilized elsewhere.[11] Final demand vectors for one Wyoming functional economic region (Region 1, Gillette-Sheridan) for the years 1960 to 1980 are presented in Table 6. Final demand vectors for the remaining regions and Wyoming totals are included in Appendix B, Tables 2-7. Projections of future levels of baseline activity were based on time series projections of the final demand vectors that existed in 1960 through 1980. Several time series regression analysis techniques were employed for each region and sector for the years 1960 through 1980 to arrive at the best set of projecting equations for the model. Equations estimated by robust regression analysis with an intercept adjustment were selected for use in the model (Table 7 and Appendix B, Tables 8-13). A detailed discussion of the regression analysis is included in Appendix A. As in the North Dakota version, projections for each final demand vector were obtained by linear extrapolations of the regression equations to the year 2005 for the respective sectors (Table 8 and Appendix B, Tables 14-19). These projections do not attempt to account for short-term deviations from historical trends. Rather, the projections represent the average final demand values that determine the levels of employment and population.

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[11]Hertsgaard, T. A., R. C. Coon, F. L. Leistritz, and N. L. Dalsted, Developing Economic Impact Projection Models for the Fort Union Coal Region, EPA-908/4-77-009, U.S. Environmental Protection Agency, Denver, 1977.

TABLE 6. SALES FOR FINAL DEMAND, BY ECONOMIC SECTOR, WYOMING REGION 1, 1960-1980, (1980 = BASE DOLLARS), MILLION DOLLARS

	Sector														
Year	(1) Ag, Lvstk	(2) Ag, Crops	(3) Metal Mining	(4) Coal Mining	(5) Pet/NG Exp/Ext	(6) Nonmetallic Mining	(7) Constr	(8) Lumber	(9) Ag Proc & Misc Mfg	(10) Pet Refining	(11) Metal Proc	(14) Elec Gen	(15) Retail Trade	(17) Bus & Pers Service	(20) Households
1960	84.0	8.8	--	2.2	103.0	4.6	15.3	4.9	12.8	13.9	--	7.5	15.5	5.2	50.8
1961	74.5	6.5	--	2.0	107.7	4.1	14.9	4.9	12.9	13.8	--	5.2	16.9	5.6	47.5
1962	75.2	12.3	--	2.1	98.9	4.1	15.8	4.9	12.9	13.9	--	5.1	18.3	6.0	49.3
1963	72.8	13.3	--	2.1	101.4	4.1	21.8	4.9	13.0	13.5	--	5.4	19.5	6.4	80.9
1964	71.8	10.5	--	2.3	114.5	4.5	20.1	4.9	13.1	17.3	--	3.7	21.0	7.1	62.5
1965	82.2	9.4	--	2.0	119.1	4.9	26.1	4.8	13.1	17.5	--	3.7	22.6	7.6	54.2
1966	94.4	9.1	--	1.8	112.1	4.6	20.0	6.2	13.6	16.3	--	4.2	24.5	8.1	55.9
1967	80.9	11.8	--	1.9	102.8	3.0	18.9	5.3	13.8	16.1	--	4.1	26.5	8.7	60.7
1968	92.7	8.3	--	1.9	130.9	3.2	20.9	7.1	13.8	15.8	--	3.0	28.8	9.7	65.7
1969	93.1	7.9	--	1.9	195.2	3.8	20.5	7.8	14.3	13.6	--	4.9	31.3	10.4	65.9
1970	86.9	7.9	--	5.8	222.5	3.7	15.4	6.3	13.5	12.8	--	5.7	34.1	11.2	67.1
1971	90.9	7.5	--	6.7	207.1	3.0	10.8	8.7	14.2	13.4	--	3.8	34.2	11.5	68.3
1972	114.6	9.7	--	3.7	189.1	3.4	23.8	12.5	14.5	13.8	--	4.2	35.3	11.7	61.5
1973	134.6	18.3	--	3.3	234.3	5.8	13.8	14.7	16.1	15.9	--	6.1	34.7	11.6	97.6
1974	89.8	12.0	--	12.4	383.5	6.5	16.6	9.4	16.5	39.2	--	4.8	32.7	11.0	71.5
1975	89.4	12.8	--	14.6	325.0	4.8	35.6	7.1	20.2	42.7	--	4.5	31.9	10.6	69.6
1976	103.2	14.2	--	35.4	329.7	5.9	11.9	12.0	22.3	44.6	--	4.6	32.3	10.7	76.0
1977	121.5	12.1	--	91.9	378.7	6.5	13.6	12.5	23.9	63.6	--	6.1	32.5	10.8	82.9
1978	135.3	10.9	--	143.2	375.2	8.3	10.3	13.6	26.0	61.6	--	31.2	33.2	11.1	98.9
1979	162.4	9.8	1.4	221.0	366.7	10.8	15.7	13.0	28.9	78.3	--	30.5	35.2	11.8	104.9
1980	126.7	8.3	0.7	307.0	505.2	8.1	29.6	13.3	31.1	113.4	--	26.7	36.4	12.1	112.7

TABLE 7. REGRESSION EQUATIONS[a] FOR PROJECTING FINAL DEMAND VECTORS FOR THE 20-SECTOR I-O MODEL, WYOMING REGION 1, (1980 = BASE DOLLARS), THOUSAND DOLLARS

Sector	Equation
(1) Ag, Livestock	Y = -5,365,463 + 2784.09(X)
(2) Ag, Crops	Y = -150,254 + 80.85(X)
(3) Metal Mining	Y = 1050.0[b]
(4) Coal Mining	Y = -789,774 + 512.39(X)
(5) Pet/NG Exp/Ext	Y = -35,332,480 + 18,072.9(X)
(6) Nonmetallic Mining	Y = -364,716 + 188.97(X)
(7) Construction	Y = -17,947.62 + 18.57(X)[c]
(8) Lumber and Assoc Prod	Y = -983,157 + 503.77(X)
(9) Ag Proc & Misc Manufacturing	Y = -1,459,976 + 752.60(X)
(10) Pet Refining	Y = -5,037,873 + 2,589.64(X)
(11) Metal Processing	Y = 0[d]
(12) Transportation	Y = 0[d]
(13) Comm & Public Utilities	Y = 0[d]
(14) Electric Generation	Y = -1,646,689 + 847.40(X)[e]
(15) Retail	Y = -1,932,187 + 994.50(X)
(16) Fin, Ins, Real Estate	Y = 0[d]
(17) Business & Pers Service	Y = -649,400 + 334.21(X)
(18) Prof & Social Service	Y = 0[d]
(19) Government	Y = 0[d]
(20) Households	Y = -4,904,891 + 2,533.06(X)

[a]Robust regression with intercept adjustment technique.
[b]Average of the last two years final demand vectors.
[c]Ordinary least-squares regression technique was used because of the nature of the data.
[d]An economic sector having no sales for final demand.
[e]Ordinary least-squares regression with an intercept adjustment technique was used because of the nature of the data.

Productivity (Gross Business Volume/Employment) Ratios

The productivity ratio for each economic sector refers to the gross business volume produced per full-time equivalent worker in that sector. Estimates were made of the gross business volume by economic sector for each region for the years 1960 to 1980 (Table 9 and Appendix B, Tables 20-25). Productivity ratios for each functional region were determined by dividing each sector's historic gross business volume (estimated by applying the interdependence coefficient matrix to the final demand vectors) by its

TABLE 8. PROJECTED FINAL DEMAND VECTORS FOR BASIC ECONOMIC SECTORS, WYOMING REGION 1, 1981, 1985, 1990, 1995, 2000, AND 2005, (1980 = BASE DOLLARS), MILLION DOLLARS

Sector	1981	1985	1990	1995	2000	2005
(1) Ag, Livestock	147.0	158.2	172.1	186.0	199.9	213.9
(2) Ag, Crops	9.8	10.2	10.6	11.0	11.4	11.8
(3) Metal Mining	1.1	1.1	1.1	1.1	1.1	1.1
(4) Coal Mining	224.8	226.8	229.4	231.9	234.5	237.1
(5) Pet/NG Exp/Ext	451.9	524.2	614.5	704.9	795.2	885.6
(6) Nonmetallic Mining	9.5	10.2	11.2	12.1	13.0	14.0
(7) Construction	18.8	18.9	19.0	19.1	19.2	19.3
(8) Lumber and Assoc Prod	14.3	16.3	18.8	21.4	23.9	26.4
(9) Ag Proc & Misc Manufacturing	30.2	33.2	36.9	40.7	44.5	48.2
(10) Pet Refining	89.6	100.0	112.9	125.9	138.8	151.8
(11) Metal Processing	--	--	--	--	--	--
(14) Electric Generation	31.2	34.6	38.8	43.0	47.3	51.5
(15) Retail	36.9	40.9	45.9	50.8	55.9	60.8
(17) Business & Pers Service	12.3	13.7	15.3	17.0	18.7	20.4
(20) Households	110.6	120.7	133.4	146.0	158.7	171.4

employment[12] in the corresponding years (Table 10 and Appendix B, Tables 26-31). The resulting estimates of gross business volume per worker for the respective sectors and years are shown in Table 11 and Appendix B, Tables 32-37. Inconsistencies in the data used to disaggregate county employment to sectors resulted in sectors having gross business volume but no employment and occassionally vice versa.

These ratios of gross business volume per worker were projected through the year 2005 by using a method similar to that utilized in projecting final demand vectors.[13] Robust regression analysis with an intercept adjustment provided estimation equations for each sector and each region (Table 12 and

[12]See Appendix A for data sources used in determining employment.

[13]These methods are similar to those employed in North Dakota. For further discussion see, Hertsgaard, T. A., S. H. Murdock, N. E. Toman, M. Henry, and R. Ludtke, REAP Economic-Demographic Model: Technical Description, North Dakota Regional Environmental Assessment Program, Bismarck, 1978; and Toman, N. E., S. H. Murdock, and T. A. Hertsgaard, REAP Economic-Demographic Model Version II: Technical Description, North Dakota Regional Environmental Assessment Program, Bismarck, 1979.

TABLE 9. GROSS BUSINESS VOLUMES OF ECONOMIC SECTORS ESTIMATED BY THE INPUT-OUTPUT MODEL, WYOMING REGION 1, 1960-1980, (1980 = BASE DOLLARS), MILLION DOLLARS

	Sector										
Year	(1) Ag, Lvstk	(2) Ag, Crops	(3) Metal Mining	(4) Coal Mining	(5) Pet/NG Exp/Ext	(6) Nonmetallic Mining	(7) Constr	(8) Lumber	(9) Ag Proc & Misc Mfg	(10) Pet Refining	(11) Metal Proc
1960	112.5	54.3	--	3.4	124.6	7.0	43.1	5.0	77.2	14.0	--
1961	100.8	48.0	--	2.9	129.7	6.4	42.0	5.0	71.3	13.8	--
1962	102.2	54.7	--	2.9	120.1	6.4	42.7	5.0	72.8	14.0	--
1963	101.9	55.9	--	3.0	122.5	6.8	52.1	5.0	73.3	13.6	--
1964	99.6	52.1	--	2.9	140.0	7.1	50.3	5.0	71.7	17.4	--
1965	112.0	55.0	--	2.6	145.2	7.8	57.2	4.9	77.4	17.6	--
1966	126.8	59.8	--	2.5	136.6	7.4	51.1	6.3	85.3	16.4	--
1967	111.0	57.6	--	2.6	126.2	5.6	48.5	5.4	78.4	16.2	--
1968	126.1	58.9	--	2.4	156.8	6.1	55.0	7.2	85.2	15.9	--
1969	127.9	59.5	--	2.7	225.6	7.0	62.1	7.9	87.2	13.7	--
1970	121.0	56.9	--	6.8	255.0	6.8	59.7	6.4	82.9	13.0	--
1971	125.7	58.3	--	7.4	238.6	5.9	53.7	8.8	86.1	13.6	--
1972	154.4	70.2	--	4.4	219.1	6.8	66.9	12.6	100.4	13.9	--
1973	182.5	89.7	--	4.3	270.5	9.7	67.5	14.9	118.0	16.0	--
1974	129.0	65.9	--	13.3	453.6	10.7	83.7	9.5	92.8	39.5	--
1975	128.8	68.9	--	15.4	392.3	9.3	97.1	7.2	98.9	43.0	--
1976	146.7	77.8	--	36.2	399.3	10.0	76.3	12.1	112.0	45.2	--
1977	172.7	86.0	--	93.0	469.5	11.3	90.5	12.6	129.6	65.2	--
1978	193.3	94.2	--	148.3	464.9	13.5	92.6	13.8	146.7	64.3	--
1979	230.4	108.2	1.6	226.0	470.4	16.8	105.8	13.2	172.5	82.3	--
1980	194.5	97.7	0.8	311.4	652.5	15.2	142.0	13.5	162.9	118.8	--

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TABLE 9. GROSS BUSINESS VOLUMES OF ECONOMIC SECTORS ESTIMATED BY THE INPUT-OUTPUT MODEL, WYOMING REGION 1, 1960-1980, (1980 = BASE DOLLARS), MILLION DOLLARS (CONTINUED)

	Sector									
Year	(12) Trans	(13) Comm & Pub Util	(14) Elec Gen	(15) Retail Trade	(16) FIRE	(17) Bus & Pers Service	(18) Prof & Soc Serv	(19) Govt	(20) Households	TOTAL
1960	4.8	24.5	7.5	168.4	33.6	18.0	16.9	21.8	252.8	989.4
1961	4.7	23.3	5.2	159.2	31.2	17.6	15.8	20.4	236.2	933.5
1962	4.6	23.7	5.1	166.5	32.5	18.5	16.3	21.1	243.9	953.0
1963	5.0	27.5	5.4	193.8	38.3	21.0	19.6	24.8	296.8	1,066.3
1964	5.1	26.2	3.7	181.7	35.2	20.5	17.9	22.9	269.7	1,029.0
1965	5.4	27.0	3.7	187.6	36.0	21.3	18.2	23.5	272.9	1,075.3
1966	5.4	27.7	4.2	196.6	37.7	22.6	19.0	24.6	283.8	1,113.8
1967	5.1	26.5	4.1	192.4	36.3	22.6	18.4	23.6	275.6	1,056.1
1968	5.8	29.7	3.0	211.4	40.0	25.2	20.4	26.1	304.9	1,180.1
1969	7.1	33.4	4.9	227.6	43.0	27.0	21.9	28.2	328.5	1,315.2
1970	7.4	34.4	5.7	231.5	43.2	27.7	22.1	28.5	332.4	1,341.4
1971	7.2	33.9	3.8	231.3	43.1	28.3	22.2	28.4	331.9	1,328.2
1972	7.5	35.7	4.2	248.9	46.7	30.3	23.7	30.6	351.9	1,428.2
1973	9.1	44.6	6.1	303.8	59.1	35.0	30.2	38.6	450.9	1,750.5
1974	11.1	46.1	4.8	279.5	53.7	31.7	27.8	35.8	416.1	1,804.6
1975	10.3	44.2	4.5	276.4	53.0	30.8	27.2	35.2	408.3	1,750.8
1976	10.8	47.4	4.6	295.8	57.2	33.1	29.7	37.9	441.1	1,873.2
1977	12.9	57.4	6.1	349.7	68.4	37.3	36.0	45.5	531.7	2,275.4
1978	13.8	65.0	31.2	397.9	79.6	41.5	41.8	52.3	614.6	2,569.3
1979	15.3	75.0	30.5	461.2	92.1	46.7	48.8	60.6	714.4	2,971.8
1980	18.7	87.7	26.7	512.5	101.8	50.6	55.2	67.6	806.7	3,436.8

TABLE 10. EMPLOYMENT BY ECONOMIC SECTOR, WYOMING REGION 1, 1960-1980

Year	Sector (1) & (2) Agric	(3) Metal Mining	(4) Coal Mining	(5) Pet/NG Exp/Ext	(6) Nonmetallic Mining	(7) Constr	(8) Lumber	(9) Ag Proc & Misc Mfg	(10) Pet Refining	(11) Metal Proc
1960	2,003	--	116	1,386	89	987	272	1,247	41	--
1961	1,975	--	136	1,474	95	1,108	285	1,397	43	--
1962	1,951	--	154	1,554	99	1,217	298	1,533	45	--
1963	1,923	--	183	1,882	124	1,235	307	1,617	51	--
1964	1,897	--	190	1,965	149	1,267	288	1,748	59	--
1965	1,913	--	127	1,881	145	1,186	321	1,817	66	--
1966	1,930	--	128	1,641	205	1,252	449	1,665	67	--
1967	1,946	--	80	1,754	204	853	172	1,691	63	--
1968	1,963	--	97	2,354	187	1,006	74	1,717	53	--
1969	1,979	--	108	2,397	217	1,152	--	1,767	68	--
1970	1,937	--	301	2,944	116	953	221	1,313	71	--
1971	1,896	--	295	2,058	66	882	147	1,416	83	--
1972	1,854	--	265	1,840	48	865	383	1,209	72	--
1973	1,813	--	77	2,009	65	1,029	309	869	77	--
1974	1,771	--	147	1,966	283	1,494	244	1,424	106	--
1975	1,789	123	114	2,416	367	1,695	86	1,419	116	--
1976	1,808	145	319	2,766	275	2,096	454	1,556	101	--
1977	1,826	--	1,140	1,810	414	2,837	522	1,948	87	--
1978	1,844	--	1,718	2,252	377	3,949	540	1,988	102	--
1979	1,862	--	2,451	2,601	492	4,008	543	2,160	98	--
1980	1,882	2	3,115	2,577	442	3,917	563	2,040	207	--

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TABLE 10. EMPLOYMENT BY ECONOMIC SECTOR, WYOMING REGION 1, 1960-1980 (CONTINUED)

	Sector									
Year	(12) Trans	(13) Comm & Pub Util	(14) Elec Gen	(15) Retail Trade	(16) FIRE	(17) Bus & Pers Service	(18) Prof & Soc Serv	(19) Govt	(20) Households	TOTAL
1960	558	628	179	2,913	457	844	564	3,439	--	15,723
1961	613	689	196	3,268	512	946	632	3,395	--	16,764
1962	662	744	211	3,594	563	1,040	694	3,440	--	17,799
1963	564	720	152	3,796	577	1,026	681	3,392	--	18,230
1964	459	687	90	4,032	610	1,021	681	3,327	--	18,470
1965	413	620	95	3,878	574	1,114	806	3,255	--	18,211
1966	523	721	94	3,803	558	1,131	857	3,285	--	18,309
1967	489	676	88	3,702	564	1,027	810	3,300	--	17,419
1968	596	690	77	3,804	587	1,135	893	3,459	--	18,692
1969	738	747	83	3,984	622	1,237	976	3,575	--	19,650
1970	638	747	84	4,054	729	1,264	990	3,546	--	19,908
1971	595	728	70	4,130	611	1,243	976	3,742	--	18,938
1972	508	596	50	3,526	560	1,088	924	3,543	--	17,331
1973	515	605	54	3,762	628	1,185	1,007	3,657	--	17,661
1974	580	585	20	3,669	750	1,191	1,057	3,766	--	19,053
1975	780	781	19	4,537	864	1,457	1,195	3,911	--	21,669
1976	688	842	31	4,976	897	1,499	1,279	4,165	--	23,897
1977	679	1,017	41	5,752	1,074	1,930	1,517	4,400	--	26,994
1978	824	967	172	5,987	1,046	1,931	1,583	4,505	--	29,785
1979	832	975	166	6,210	1,181	2,522	1,828	4,721	--	32,650
1980	746	949	143	5,747	1,203	2,274	1,935	4,961	--	32,703

TABLE 11. GROSS BUSINESS VOLUME TO EMPLOYMENT (PRODUCTIVITY) RATIOS, BY ECONOMIC SECTOR, WYOMING REGION 1, 1960-1980, (1980 = BASE DOLLARS)

	Sector									
Year	(1) & (2) Agric	(3) Metal Mining	(4) Coal Mining	(5) Pet/NG Exp/Ext	(6) Nonmetallic Mining	(7) Constr	(8) Lumber	(9) Ag Proc & Misc Mfg	(10) Pet Refining	(11) Metal Proc
1960	83,275	--	29,310	89,899	78,652	43,668	18,382	61,909	341,463	--
1961	75,342	--	21,324	87,992	67,368	37,906	17,544	51,038	320,930	--
1962	80,420	--	18,831	77,284	64,646	35,086	16,779	47,489	311,111	--
1963	82,059	--	16,393	65,090	54,839	42,186	16,287	45,331	266,667	--
1964	79,968	--	15,263	71,247	47,651	39,700	17,361	41,018	294,915	--
1965	87,297	--	20,472	77,193	53,793	48,229	15,265	42,598	266,667	--
1966	96,684	--	19,531	83,242	36,098	40,815	14,031	51,231	244,776	--
1967	86,639	--	32,500	71,950	27,451	56,858	31,395	46,363	257,143	--
1968	94,244	--	24,742	66,610	32,620	54,672	97,297	49,621	300,000	--
1969	94,694	--	25,000	94,118	32,258	53,906	---	49,349	201,471	--
1970	91,843	--	22,591	86,617	58,621	62,644	28,959	63,138	183,099	--
1971	97,046	--	25,085	115,938	89,394	60,884	59,864	60,805	163,855	--
1972	121,143	--	16,604	119,076	141,667	77,341	32,898	83,044	193,056	--
1973	150,138	--	55,844	134,644	149,231	65,598	48,220	135,788	207,792	--
1974	110,051	--	90,476	230,722	37,809	56,024	38,934	65,169	372,642	--
1975	110,509	--	135,088	162,376	25,341	57,286	83,721	69,697	370,690	--
1976	124,170	--	113,480	144,360	36,364	36,403	26,652	71,979	447,525	--
1977	141,676	--	81,579	259,392	27,295	31,900	24,138	66,530	749,425	--
1978	155,911	--	86,321	206,439	35,809	23,449	25,556	73,793	630,392	--
1979	181,847	--	92,207	180,854	34,146	26,397	24,309	79,861	839,796	--
1980	155,260	400,000	99,968	253,201	34,389	36,252	23,979	79,853	573,913	--

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TABLE 11. GROSS BUSINESS VOLUME TO EMPLOYMENT (PRODUCTIVITY) RATIOS, BY ECONOMIC SECTOR, WYOMING REGION 1, 1960-1980, (1980 = BASE DOLLARS) (CONTINUED)

	Sector								
Year	(12) Trans	(13) Comm & Pub Util	(14) Elec Gen	(15) Retail Trade	(16) FIRE	(17) Bus & Pers Service	(18) Prof & Soc Serv	(19) Govt	(20) Households
1960	8,602	39,013	41,899	57,810	73,523	21,327	29,965	6,339	--
1961	7,667	33,817	26,531	48,715	60,938	18,605	25,000	6,009	--
1962	6,949	31,855	24,171	46,327	57,727	17,789	23,487	6,134	--
1963	8,865	38,194	35,526	51,054	66,378	20,468	28,781	7,311	--
1964	11,111	38,137	41,111	45,065	57,705	20,078	26,285	6,883	--
1965	13,075	43,548	38,947	48,376	62,718	19,120	22,581	7,220	--
1966	10,325	38,419	44,681	51,696	67,563	19,982	22,170	7,489	--
1967	10,429	39,201	46,591	51,972	64,362	22,006	22,716	7,152	--
1968	9,732	43,044	38,961	55,573	68,143	22,203	22,844	7,546	--
1969	9,621	44,712	59,036	57,129	69,132	21,827	22,439	7,888	--
1970	11,599	46,051	67,857	57,104	59,259	21,915	22,323	8,037	--
1971	12,101	46,566	54,286	56,005	70,540	22,768	22,746	7,590	--
1972	14,764	59,899	84,000	70,590	83,393	27,849	25,649	8,637	--
1973	17,670	73,719	112,963	80,755	94,108	29,536	29,990	10,555	--
1974	19,138	78,803	240,000	76,179	71,600	26,616	26,301	9,506	--
1975	13,205	56,594	236,842	60,921	61,343	21,139	22,762	9,000	--
1976	15,698	56,295	148,387	59,445	63,768	22,081	23,221	9,100	--
1977	18,999	56,441	148,780	60,796	63,687	19,326	23,731	10,341	--
1978	16,748	67,218	181,395	66,461	76,099	21,492	26,406	11,609	--
1979	18,389	76,923	183,735	74,267	77,985	18,517	26,696	12,836	--
1980	25,067	92,413	186,713	89,177	84,622	22,252	28,527	13,626	--

TABLE 12. REGRESSION EQUATIONS[a] FOR PROJECTION OF GROSS BUSINESS VOLUME TO EMPLOYMENT (PRODUCTIVITY) RATIOS FOR 20-SECTOR WYOMING I-O MODEL, REGION 1, (1980 = BASE DOLLARS), THOUSAND DOLLARS

Sector	Equation
(1) & (2) Agriculture	Y = -7,668.54 + 3.96(X)
(3) Metal Mining	Y = 400[b]
(4) Coal Mining	Y = -8,887.29 + 4.54(X)
(5) Pet/NG Exp/Ext	Y = -12.188.56 + 6.27(X)
(6) Nonmetallic Mining	Y = 34.389[b]
(7) Construction	Y = 444.08 - 0.21(X)
(8) Lumber and Assoc Prod	Y = -1,122.63 + 0.58(X)
(9) Ag Proc & Misc Manufacturing	Y = -3,759.48 + 1.94(X)
(10) Pet Refining	Y = -27,683.15 + 14.34(X)
(11) Metal Processing	Y = 10,000[c]
(12) Transportation	Y = -1,206.29 + 0.62(X)
(13) Comm & Public Utilities	Y = -3,382.65 + 1.75(X)
(14) Electric Generation	Y = -17,024.65 + 8.70(X)
(15) Retail	Y = -2,099.17 + 1.10(X)
(16) Fin, Ins, Real Estate	Y = -1,285.25 + 0.691(X)
(17) Business & Pers Service	Y = -157.27 + 0.09(X)
(18) Prof & Social Service	Y = -71.69 + 0.051(X)
(19) Government	Y = -462.03 + 0.24(X)
(20) Households	Y = 10,000[c]

[a]Robust regression with intercept adjustment technique.
[b]The 1980 productivity ratio was used for the projection period.
[c]Because very little or no employment exists in this sector for Region 1, arbitrary, very large numbers were utilized in developing projections of baseline employment.

Appendix B, Tables 38-43). These equations were used to project gross business volume per worker to the year 2005. The resulting estimates of gross business volume/employment ratios projected through the year 2005 are shown for Region 1 in Table 13 and for the remaining regions in Appendix B, Tables 44-49.

County and Municipal Employment Allocators

Baseline employment is allocated to cities and counties on the basis of each city or county's projected share of total regional employment. Projected shares for each city were extrapolations of that city's share of county

TABLE 13. PROJECTED GROSS BUSINESS VOLUME TO EMPLOYMENT (PRODUCTIVITY) RATIOS FOR WYOMING REGION 1, 1981, 1985, 1990, 1995, 2000, AND 2005 (1980 = BASE DOLLARS)

Sector	1981	1985	1990	1995	2000	2005
(1) & (2) Agriculture	172,260	188,100	207,900	227,700	247,500	267,300
(3) Metal Mining	400,000	400,000	400,000	400,000	400,000	400,000
(4) Coal Mining	101,910	120,070	142,770	165,470	188,170	210,870
(5) Pet/NG Exp/Ext	226,040	251,120	282,470	313,820	345,170	376,520
(6) Nonmetallic Mining	34,389	34,389	34,389	34,389	34,389	34,389
(7) Construction	28,280	27,440	26,390	25,340	24,290	23,240
(8) Lumber & Assoc Prod	25,770	28,090	30,990	33,890	36,790	39,690
(9) Ag Proc & Misc Mfg	81,720	89,480	99,180	108,880	118,580	128,280
(10) Pet Refining	710,050	767,410	839,110	910,810	982,510	1,054,210
(11) Metal Processing	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000
(12) Transportation	21,310	23,790	26,890	29,990	33,090	36,190
(13) Comm & Public Util	82,350	89,350	98,100	106,850	115,600	124,350
(14) Electric Generation	201,350	236,150	279,650	323,150	366,650	410,150
(15) Retail	78,830	83,230	88,730	94,230	99,730	105,230
(16) Fin, Ins, R.E.	82,930	85,694	89,149	92,604	96,059	99,514
(17) Bus & Pers Service	20,930	21,290	21,740	22,190	22,640	23,090
(18) Prof & Soc Service	29,290	29,494	29,749	30,004	30,259	30,514
(19) Government	13,170	14,130	15,330	16,530	17,730	18,930
(20) Households	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000

employment between 1960 and 1980.[14] Since employment data were not available at the subcounty level, population was used as a proxy. Each city's share of employment was based on that city's share of total municipal population in the functional economic region from 1960 to 1980. Cities' shares were used to allocate the region's total nonagricultural employment among the cities in each region to 2005. In similar fashion, the region's agricultural employment was allocated to the counties in the region based on each county's share of the region's agricultural employment from 1960 to 1980. Agricultural employment projections to 2005 were based on the county's share in 1980. County and city allocators used in the adapted version are presented for Region 1 in Table 14 and for the remaining Regions in Appendix B, Tables 50-54.

Project-Specific Economic Parameters

Economic activity associated with the construction and operation of resource extraction and conversion projects was assumed to be largely additive to trends in baseline activity. The adapted version first computes the baseline economic activity in the region (along with its counties and municipalities) and then computes the economic activity associated with the development scenario specified by the user. Assessment of the economic impacts of a new resource project (or several projects) is based on a set of project-specific data assembled for each project. The project data file has been designed to allow rapid updating of information regarding specific projects (e.g., changes in construction timetables and labor requirements) and for the addition of information on new projects.

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[14]Constraints were imposed on the extrapolation process such that the sum of all shares would equal 1.00 (i.e., 100 percent of regional employment) and that no city or county's share would be less than zero or more than one.

TABLE 14. PROJECTED CITY SHARE OF REGIONAL EMPLOYMENT BY CITY AND COUNTY,.WYOMING REGION 1, 1980, 1985, 1990, 1995, AND 2000

County	City	1980	ADJ 1980	1985	ADJ 1985	1990	ADJ 1990	1995	ADJ 1995	2000	ADJ 2000
Campbell	Gillette	0.2921827		0.3585472		0.4399851		0.5399204		0.6625537	
			0.2921886		0.3283982		0.3626043		0.3948238		0.425107
	Wright	0.0288959		0.0293724		0.0298568		0.0303491		0.0308496	
			0.0288965		0.0269026		0.0246058		0.0221932		0.019794
Crook	Hulett	0.0070073		0.0061182		0.0053420		0.0046642		0.0040724	
	Moorcroft	0.0244172		0.0232447		0.0221285		0.0210659		0.0200543	
	Sundance	0.0261751		0.0247621		0.0234254		0.0221608		0.0209645	
Johnson	Buffalo	0.0914804		0.0884601		0.0855396		0.0827155		0.0799845	
	Kaycee	0.0065257		0.0058332		0.0052141		0.0046607		0.0041661	
Sheridan	Clearmont	0.0045993		0.0043897		0.0041896		0.0039987		0.0038164	
	Dayton	0.0168799		0.0183887		0.0200323		0.0218228		0.0237734	
			0.0168802		0.0168424		0.0165092		0.0159582		0.015253
	Ranchester	0.0157724		0.0184312		0.0215383		0.0251691		0.0294119	
			0.0157727		0.0168814		0.0177503		0.0184052		0.018871
	Sheridan	0.3647173		0.3522114		0.3401343		0.3284713		0.3172082	
Weston	Newcastle	0.0865921		0.0746963		0.0644347		0.0555829		0.0479470	
	Osage	0.0060200		0.0054445		0.0049241		0.0044534		0.0040276	
	Upton	0.0287276		0.0258153		0.0231983		0.0208465		0.0187332	
SUM OF DECLINING COUNTIES		0.6462619		0.6109754		0.5785304		0.5486197		0.5209742	
ONE MINUS DECLINING COUNTIES		0.3537381		0.3890246		0.4214696		0.4513803		0.4790258	
SUM OF INCREASING COUNTIES		0.3537309		0.4247394		0.5114123		0.6172612		0.7465885	
ADJUSTED TOTAL			0.9999998		0.9999999		0.9999999		0.9999999		1.000000

The final demand vector of the site-specific data file for each project is applied to the input-output model. In the construction phase of a project, this consists of annual expenditures to the contract construction, retail trade, and household sectors. During the operational phase, annual expenditures are to the retail trade and household sectors. The construction phase final demand vector indicates the amount of injection of new dollars into the regional spending stream via the contract construction sector (for bid lettings to local contractors), retail trade sector (for supplies and materials purchased locally), and household sector (for wages and salaries to employees living in the area).

The data file for each energy development project that the user may specify contains the following set of specifications:

1. Project number,
2. Start date,
3. Location of project,
4. Project name and description,
5. Number of years after the start of construction that operation begins,
6. Land taken for plant and/or mine site,
7. Acres mined per year,
8. Land taken for urban uses,
9. Tons mined per year,
10. Kilowatt hours of electricity sold per year,
11. Cubic feet of synthetic natural gas sold per year,
12. Mine value for property tax purposes,
13. State share of Federal coal royalties,

14. Project final demand vectors,
    a) Households,
    b) Retail trade, and
    c) Construction,
15. Direct Labor,
    a) Construction (temporary workers), and
    b) Operation or permanent workers.

Significant changes in sales for final demand and employment have occurred in Wyoming since the end of the baseline time period (1980). Public sentiment and unfavorable operating experiences, coupled with a substantial decrease in projected electric power consumption, have virtually halted construction of nuclear-powered electric generating facilities in the United States. This decline in projected nuclear power production has decreased demand for uranium, the mineral used to fuel reactors. Uranium mining in Wyoming quickly reflected this change with production and employment declining significantly from 1980 levels. The oil industry also has experienced some decline since 1980. Significant coal mine expansion and/or development along with coal-fired electric generation expansion has occurred since 1980. Project files were used to incorporate into the model industry decline and growth since the end of the historical baseline (1980), and to reflect future development or expansion only in the planning phase.

Industrial declines were handled as if the lower level of production occurred permanently. To accomplish this, the projected baseline final demand vector was set as a constant value reflecting reduced production. A project file was developed to allow the industry to resume its growth trend at a point in time when recovery would most likely occur. By handling declines in this manner, the project actually becomes part of the projected baseline economic activity of the region. Projected industry developments beyond baseline growth

were included as additional project files that could be added to the baseline project file. As the result of a comprehensive monitoring system, detailed data were available for existing and proposed mineral development projects in Wyoming.[15]

Extensive coal mine expansion and/or development has occurred in Wyoming between 1980 and 1983. Project files were developed to account for this expansion or development. These projects should be included in baseline economic activity runs. Development beyond this level is included as another project which can be superimposed upon the baseline project, if desired. Similar situations in other industries were treated in the same manner. Developments being planned also were set up as project files so they could be added to the baseline to assess impacts. Although various configurations can be selected for the types of resource development projects, characteristics of a typical coal mine expansion project in northeastern Wyoming are displayed in Appendix C.

Description of the Demographic Module

The demographic data base used in the model consists of four major components:

1. Detailed county population consisting of 75 age cohorts[16] (single-year) by gender;
2. Birth rates by county of residence for six female five-year cohorts from 15 to 45 years of age;

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[15]Goodier, John T., Wyoming Mineral Development Monitoring System, Unpublished Data and Updates, Wyoming Department of Economic Planning and Development, Cheyenne, January 1983.

[16]Census information consisted of 104 age cohorts from 0 to 103. Cohorts 0 and 1 were added to form the first age cohort and cohorts 75 and over were added to form the last age cohort.

3. Survival rates of 75 age cohorts[17] (single-year) by gender; and
4. Migration rates by county for age cohorts (single-year) over 64 by gender.

The data sources and methods used in the preparation of each of these components are described below.

Population by Age and Gender

Single-year cohort populations were derived from the STF 2A 1980 census data tape for Wyoming.[18] The population counts are in 75 single-year age groups[19] by male and female for each county in 1980.

Birth Rates

Three sets of age-specific birth rates were computed for each county in Wyoming for use in the model. These rates were computed using the general formula:

$$ASFR_i = \frac{({}_iB_{1979} + {}_iB_{1980} + {}_iB_{1981})/3}{{}_iFP_{1980}}$$

where: $ASFR_i$ = age-specific fertility rates for females in age group (cohort) i;

$({}_iB_{1979, 1980, 1981})/3$ = average number of births to females in age group i in 1979, 1980, and 1981;

${}_iFP_{1980}$ = female population of age group i in 1980.

Data on births were obtained from the Wyoming Department of Health and Social Services, Bureau of Vital Statistics; 1980 data on the number of females were

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[17] Ibid.

[18] Ibid.

[19] Ibid.

obtained from the 1980 STF 2A census data tape for Wyoming. The use of an average number of births for a three-year period is a standard procedure[20] used to eliminate the effects of bias due to chance fluctuations in the number of births from year to year.

The three sets of rates computed for the projection period for each county were patterned after completed levels of fertility of 1.8, 2.1, and 2.5 births per female. These total fertility levels are the sum of a set of age-specific fertility rates for women in the childbearing ages that would result if each female were to experience a given set of age-specific rates for each age group as she aged through her reproductive lifetime. Six five-year cohort rates were calculated for each county for 1980. A 25-year national fertility trend for the corresponding six five-year cohorts (i.e., women 15 to 45 years of age) was utilized to project total fertility over time.[21] The age-specific national fertility trends were applied to the ratio of county age-specific fertility rates for 1980 for each projection year resulting in a set of age-specific fertility rates for each county and each level of completed fertility.[22] An example of county fertility rates for 1980 is provided in Table 15 for Campbell County.

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[20]Shryock, H. S., and J. S. Siegel, The Methods and Materials of Demography, U.S. Bureau of the Census, U.S. Government Printing Office, Washington, D.C., 1973.

[21]U.S. Bureau of the Census, Projections of the Population of the United States 1977 to 2050, Current Population Reports P-25, No. 704, U.S. Government Printing Office, Washington, D.C., 1977.

[22]Tarver, J. D., and T. R. Black, Making County Population Projections: A Detailed Explanation of a Three-Component Method, Illustrated by Reference to Utah Counties, Utah Agricultural Experiment Station, Logan, 1966; and Irwin, Richard, Guide for Local Area Population Projections, U.S. Bureau of the Census, U.S. Government Printing Office, Washington, D.C., 1977.

TABLE 15. FERTILITY RATES[a] FOR CAMPBELL COUNTY, WYOMING, 1980

Age Group	Birth Rate
15-19[b]	.029520
20-24	.066912
25-29	.103729
30-34	.057471
35-39	.017760
40-44[c]	.001789

[a]Using national completed levels of fertility of 2.1 births per female.
[b]Births to women less than 15 years of age are included in this category.
[c]Births to women over 44 years of age are included in this category.

Survival Rates

Survival rates for 15 age and gender cohorts (Table 16) were determined from a 1980 life table for Wyoming.[23] An average of total deaths in each cohort from 1979 through 1981 was used to reduce yearly fluctuations. The survival rates for the 15 age-gender cohorts were disaggregated into 75 single-year age-gender cohorts conforming to the detailed population.

The relatively small variation in mortality from one area to another allowed the application of state survival rates to all of the counties. These rates were computed using the life table survival rate method:

$$S_{x,\,x+t} = \frac{L_{x+t}}{L_x}$$

where: $S_{x,\,x+t}$ = probability of a member of a cohort surviving from the time period x to x + t;

L_{x+t} = number of persons in the cohort alive at the end of the period, x + t;

L_x = number of persons in the cohort alive at the beginning of the period, x.

[23]Computed from data supplied by the Vital Statistics Division, Department of Health and Social Services, Unpublished Data, Cheyenne, Wyoming, 1982. The model applies one rate to all individuals over the age of 70, thus, this rate is adjusted downward to avoid inflating deaths in this age category due to its cumulative quality.

TABLE 16. WYOMING SURVIVAL RATES BY AGE AND GENDER

Age	Male	Female
0-4	0.999686	0.999791
5-9	0.999689	0.999867
10-14	0.999449	0.999816
15-19	0.998571	0.999651
20-24	0.998769	0.999708
25-29	0.999771	0.999702
30-34	0.998451	0.999517
35-39	0.998252	0.999230
40-44	0.997839	0.998975
45-49	0.996213	0.997965
50-54	0.995450	0.997585
55-59	0.992328	0.995825
60-64	0.990448	0.993670
65-69	0.983648	0.988281
70+	0.981548	0.985138

L_{x+t} and L_x are derived from the appropriate column of a standard life table. Survival rates for the 1979 to 1981 period were assumed to prevail throughout the projection period.

Migration Rates

Migration rates were not specified for age-gender cohorts 1 to 65 because the employment-based method determines migration. The interface component, described later in the report, uses a comparison procedure[24] between required employment and available work force, ages 15 to 64, to determine yearly net migration. The migration of individuals under age 15 was determined as a direct result of net work force migration. A profile of a migrating family was developed from survey data and applied to in- and out-migrants providing migration levels for age-gender cohorts from 1 to 14.

Migration rates were utilized for age-gender cohorts (single-year) 65 to 74+. Rates were computed for each county in 1980 from two five-year

[24]For a more detailed discussion of migration procedures, see pages 41-44 of Leistritz, et al., 1982, op. cit.

age-gender cohorts, 65-69 and 70-74+. These rates were computed by using an average of the rates computed by forward and reverse survival rate methods,[25] using data from the 1970 census first count, file B and STF 2A for 1980. Migration rates for 1980 were assumed to prevail throughout the projection period. The 1980 net migration rates for Campbell County are provided in Table 17.

TABLE 17. MIGRATION RATES FOR CAMPBELL COUNTY, WYOMING, 1980

Age Group	Male	Female
65	-.031257	-.019933
66	-.031257	-.019933
67	-.031257	-.019933
68	-.031257	-.019933
69	-.031257	-.019933
70	-.032900	.003675
71	-.032900	.003675
72	-.032900	.003675
73	-.032900	.003675
74+	-.032900	.003675

Description of the Residential Allocation Module

The residential allocation component of the model estimates the probable settlement patterns of in-migrating workers and their dependents.[26] The allocations were made at the municipal level using a gravity model. Use of this model assumed that the number of in-migrants moving to a city will be inversely related to the distance between the city and the employment site. In addition, qualitative factors were assumed to exist among settlements and to affect workers' choices. Previously collected data on settlement patterns

[25]Leistritz, F. Larry, and Steven H. Murdock, 1981, op. cit; Shryock, H. S., and J. S. Siegel, 1973, op. cit.; and Bowles, G. K., C. L. Beale, and E. S. Lee, Net Migration of the Population, 1960-70 by Age, Sex, and Color, University of Georgia Printing Department, Athens, 1975.

[26]Worker demographic characteristics and labor force participation rates used in the Wyoming version are equivalent to those in the North Dakota version. See Leistritz, et al., 1982, op. cit.

of workers were used as a basis for estimating parameters for the gravity model.[27] In symbolic form, these assumptions may be stated as follows for each site:

$$M_i = \frac{\left[\dfrac{E_{B_{t-1}} + fE_{C_{t-2}} + E_{O_{t-1}} + E_{I_{t-1}}}{d_{ij}^{a}}\right] W_i}{\sum_{i=1}^{n}\left[\dfrac{E_{B_{t-1}} + fE_{C_{t-2}} + E_{O_{t-1}} + E_{I_{t-1}}}{d_{ij}^{a}}\right] W_i}$$

where: M_i = the fraction of the project-related employees who reside in city i;

E_B, E_C, E_O, and E_I are baseline, construction, operating, and secondary (indirect and induced) employment, respectively, in the previous year (except for construction employment, which is two years previous);

f = a fraction applied to construction employment in the year t-2;

d_{ij}^{a} = the distance from municipality i to the location of project j raised to the power a;

W_i = the relative qualitative attractiveness of city i.

The residential allocation calculations by the gravity model include 96 municipalities within Wyoming as an inital set, plus 46 adjoining municipalities in South Dakota, Nebraska, Colorado, Utah, Idaho, and

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[27] Leholm, Arlen G., F. Larry Leistritz, and James S. Wieland, Profile of North Dakota's Electric Power Plant Construction Work Force, Agricultural Economics Statistical Report No. 22, Department of Agricultural Economics, North Dakota Agricultural Experiment Station, North Dakota State University, Fargo, 1976; Mountain West Research, Inc., Construction Worker Profile, Old West Regional Commission, Washington, D.C., December 1975; and Wieland, James S., "Socioeconomic Characteristics and Settlement Patterns Associated with Operating and Construction Work Forces in North Dakota, South Dakota, and Montana," Unpublished M.S. Thesis, Department of Agricultural Economics, North Dakota State University, Fargo, 1977.

Montana.[28] This set of municipalities is further reduced to only those cities within this group that fall within a 150-mile radius of a given project site.[29] Non-Wyoming municipalities are allowed to attract population away from Wyoming during gravity model calculations, but no annual calculations of changes in the population of non-Wyoming cities are made. These cities are assumed to have an employment base equal to their 1980 estimated employment plus construction, operation, and secondary workers that are projected to migrate to these cities.

As in the North Dakota version of the model, the user may specify values for the power (a) to which distance is raised. Separate gravity model allocations are made for each type of worker. Unless the user specifies otherwise, the gravity powers are 1.5 for construction workers, 2.9 for operating workers, and 1.6 for project-related secondary workers. This results in a smaller proportion of construction workers than operating workers being allocated to municipalities near the plant site. Slightly more indirect workers than construction workers are allocated to nearby cities.

The gravity model allocates construction, operation, and secondary workers to communities as a factor of commuting distance to the site of a project, but secondary workers are assumed to both reside and work in the community to which they have been allocated. The residential allocation module is computed for each year there is project-related in-migration, using appropriate previous year's employment of each type for each city.

Modification of the Fiscal Impact Module

Fiscal impact analysis is often used to describe the comparison between revenue and expenditure flows over time as communities respond to energy

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[28]For a listing of the municipalities included in the Wyoming adaptation, see Appendix B, Table 1.

[29]A 142 x 142 matrix was created showing the distances (highway mileage) between all communities included in the Wyoming version.

resource and industrial development projects. The primary focus is on the public sector costs and revenues associated with a particular project. Using traditional forms of cash-flow analysis in determining costs and revenues, the typical result of fiscal impact analysis is a statement of net surplus or deficit. The key features of this analysis are (1) an exclusive focus on the revenues received and the costs incurred by governmental units, and (2) inclusion of the distribution of costs and revenues through time.[30]

The fiscal implications of any energy development project depend on a number of factors, notably project characteristics (e.g., the magnitude of investment and the size and scheduling of the work force), site area characteristics (e.g., state and local tax structures and the capacity of existing service facilities), and the nature of the economic and demographic effects resulting from the project.

Although the basic structure of the North Dakota fiscal impact module remains relatively intact in the Wyoming version, various fiscal functions, which estimate the public sector costs and revenues associated with energy development projects, have been modified to conform to those site area characteristics unique to Wyoming. The data sources[31] and methods used in modifying the fiscal model parameters are described below.

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[30]Leistritz, F. Larry and Steve H. Murdock, 1981, op. cit.

[31]The general sources utilized in modifying the fiscal module for Wyoming were: Goodier, John T. and Dale S. Hoffman, Wyoming Mineral Yearbook, 1982, Mineral Division, State Department of Economic Planning and Development, Cheyenne, 1982; Thompson, Layton S. and Willard D. Shutz, The Taxation and Revenue System of State and Local Governments in Wyoming, Wyoming Agricultural Experiment Station, University of Wyoming, Laramie, 1978; Voelker, Stanley W., State and Local Taxes Affected by Energy Developments in Selected Western States, EPA-600/7-81-005, U.S. Environmental Protection Agency, Denver, 1980; Department of Revenue and Taxation, Annual Report of the Wyoming Department of Revenue and Taxation, Cheyenne, 1982; and Ad Valorem Tax Division, Annual Report of the Wyoming State Board of Equalization, Department of Revenue and Taxation, Cheyenne, 1982.

Revenue Estimation

The principal difference between the North Dakota and Wyoming taxation systems is that Wyoming does not have a personal or corporate income tax. The three income sources that yielded the greatest revenue for Wyoming in 1980 were property taxes (44 percent); sales taxes (24 percent); and mineral severance taxes (15.5 percent), primarily oil and gas, coal, and uranium. Together, these taxes accounted for over $568 million or nearly 85 percent of the total tax revenue collected in 1980.[32]

Changes in Wyoming's state and local tax collections were obtained by applying the appropriate tax rate to the estimated change in the relevant tax base. A discussion of the various tax estimators for the state and local governments used in the Wyoming version is presented below.

State Revenue Sources.

1. State Sales and Use Tax: The state sales and use tax estimator is 3.71 percent of the gross business volumes of the retail, business and personal services, and petroleum and natural gas exploration/extraction sectors.[33] This estimator was derived by comparing the sales and use tax collections to the estimated gross business volumes of these sectors for the years 1976 to 1980.

The sales tax applies not only to retail sales of tangible commodities, but also to certain specified services, notably business and personal services, and various exploration and extraction services to the petroleum industry. The use tax imposed on purchases made outside Wyoming for first use, storage, or consumption within the state complements the sales tax.

2. Other State-Collected Taxes: The various highway taxes, the liquor tax, and the tobacco tax were estimated on a per capita basis from data

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[32]Department of Revenue and Taxation, 1982, op. cit.

[33]Ibid.

obtained from the State Department of Revenue and Taxation and the Wyoming Liquor Commission.[34] Highway taxes were defined, for purposes of this study, to include revenues from the motor vehicle registration fees, gross vehicle weight fees, and the motor vehicle fuel tax. The per capita estimates, in 1980 prices, for the various taxes were:

Highway Taxes	$141.87
Cigarette Tax	$ 12.34
Liquor Tax	$ 13.11

3. Mineral Severance Taxes: Although most of the excise taxes on minerals have remained relatively unchanged since 1977, the 1981 legislature imposed new excise taxes on the privilege of mining in the state.[35] These were combined with existing severance and excise taxes and are described in Table 18. The excise taxes are essentially levied on the gross proceeds of minerals in Wyoming. Gross proceeds are defined as the value of the mineral at the mine, prior to processing and transportation. State excise taxes are in addition to the ad valorem property taxes which also are levied on gross proceeds.

a. Coal. As of 1978, state excise taxes levied on Wyoming coal have been 10.5 percent of gross proceeds. The effective tax rate of 10.5 percent is equivalent to a tax of $.874 tax per ton of coal, in 1980 prices. The excise taxes are earmarked for specific uses except for 2 percent which accrues to the state's general fund.[36]

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[34]Department of Revenue and Taxation, 1982, op. cit.; and Kiser, Dee, Personal Communication, Wyoming Liquor Commission, Cheyenne, January 1983.

[35]Department of Revenue and Taxation, 1982, op. cit.; and Minerals Division of the State Department of Economic Planning and Development, 1982, op. cit.

[36]Goodier, John T. and Dale S. Hoffman, 1982, op. cit.

TABLE 18. EXCISE TAXES LEVIED AGAINST MINERALS, WYOMING, 1981

Disposition of Revenues	Percent of Gross Proceeds					
	Coal	Uranium	Trona	Petroleum and Natural Gas	Stripper Oil	Other Minerals
General Fund	2.0	2.0	2.0	2.0	--	2.0
Permanent Mineral Trust Fund	2.5	2.0	2.0	2.17	2.17	--
Coal Tax Revenue Account	2.0	--	--	--	--	--
Capital Facilities Revenue Account	1.5	1.5	1.5	--	--	--
Water Development Account	1.5	--	--	.16	.17	--
Highway Fund	1.0	--	--	.67	.66	--
Agency and Trust--Cities and Towns	--	--	--	.75	.75	--
Agency and Trust--Counties	--	--	--	.25	.25	--
Total Levies	10.5	5.5	5.5	6.00	4.00	2.0

SOURCE: Department of Revenue and Taxation, Annual Report of the Wyoming Department of Revenue and Taxation, Cheyenne, 1982.

The permanent mineral trust fund remains inviolate, although all income from the fund is deposited in the state's general fund. The levy for the coal tax revenue account, initially called the coal tax for impact assistance, is 2 percent. The funds, administered by the Wyoming Farm Board, are used to finance water, sewer, highway, and road and street projects in areas impacted by coal production. No less than 50 percent of these revenues are to be allocated to finance state highway, county road, or city street projects. This tax is due to expire when cumulative collections total $160 million.

Funds in the capital facilities revenue account are used for the designing, maintaining, operating, equipping, repairing, and financing of capital facilities for state government operations. The tax levy will expire when taxes collected total $250 million.

Receipts from the 1.5 percent tax on water development projects are deposited in the water development account. When this account totals $100 million, proceeds are to be deposited in the general fund until the water fund balance is reduced to $50 million. The 1 percent levy for the highway fund will expire when the account reaches $6 million.

b. Oil and Stripper Oil. As of 1981, the state excise taxes levied on extracted oil in Wyoming have amounted to 4.0 percent of the gross proceeds. That legislative session enacted an additional excise tax of 2 percent of the gross proceeds on the extracted oil and gas. The revenue collected from this additional 2 percent tax is transferred to the Trust and Agency Fund with the resultant

distribution shown in Table 18.[37] In 1980 prices, the effective tax rate (including stripper oil) of 9.15 percent was equivalent to $1.56 tax per barrel of oil.

c. Natural Gas. Similarly, state excise taxes against natural gas extracted in Wyoming increased to 6 percent in 1981. In 1980 prices, the effective tax rate of 4 percent amounted to $.055 per thousand cubic feet (mcf) of natural gas.

d. Uranium. The effective tax rate of 5.5 percent amounted to $.69 per ton of uranium in 1980 prices.

e. Trona. The effective tax rate of 5.5 percent on gross proceeds amounted to $.509 per ton of trona in 1980 prices.

4. Federal Mineral Royalties: The 1976 federal leasing law mandates that 50 percent of the royalties collected from development of federal lands be returned to the state. Cumulative royalty payments from the federal government for mineral operations in Wyoming (through December 1980) amounted to over $349 million. Federal royalties are not reported separately by commodity or specific mining operation. These receipts are distributed among six funds: school foundation programs (37.5 percent); state highway fund (26.25 percent); county highway fund (2.25 percent); incorporated municipalities (7.5 percent); capital construction (19.75 percent); and the University of Wyoming (6.75 percent).

Local Revenue Sources.

1. Ad Valorem Property Tax: The local property tax estimator is 1.50 percent of the market value of the property. This estimator was based on the 1980 state average sales assessment ratio of 23.21 percent and the state average mill rate of 64.21.[38] Added property tax revenue was determined by applying

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[37]Department of Revenue and Taxation, 1982, op. cit.

[38]Ad Valorem Tax Division, 1982, op. cit.

the estimator to the projected market value of new business structures and residences.

The estimated investment cost for houses, apartments, and business structures was used as estimated market value for those structures, and the market value for mobile homes was estimated at one-half the purchase price. Capital investment in business structures was estimated by Prestgard[39] at $0.22 per dollar of gross business volume. The estimates of investment cost per unit in 1980 prices are equivalent to those used in the North Dakota version:

Houses	$59,157
Apartments	$26,162
Mobile Homes	$13,392

In 1980, Wyoming property tax revenues were distributed in the following manner:[40]

Disposition	Percent
Schools	67.81
Counties	17.45
Foundation Program	9.27
Special Districts	3.74
Municipal	1.73

Wyoming also subjects the gross proceeds of coal mines to the ad valorem property tax. Property tax revenues from mine property were estimated in 1980 prices as follows:[41]

Capital investment in mine = ($8.32 x size of mine in tons per year)
Mine value = (capital investment x 100 percent)
Tax revenue = (mine value x 1.5 percent)

2. Optional Sales Tax: The 1973 Legislative Session provided counties with the authority, by election, to impose an optional sales tax of 1 percent in addition to the existing state sales tax. This tax is generally applied to

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[39]Prestgard, P. G., "Effect of Coal Development on Public Costs in North Dakota," Unpublished M.S. Thesis, Department of Agricultural Economics, North Dakota State University, Fargo, 1974.

[40]Ad Valorem Tax Division, 1982, op. cit.

[41]Goodier, J. T. and D. S. Hoffman, 1982, op. cit.

the sale, lease, or rental of tangible personal property. Of the 23 Wyoming counties, over two-thirds have authorized an optional sales tax. The following is a list of counties imposing the optional tax and their effective dates.[42]

County Name	Effective Date
Campbell	12-01-76
Carbon	12-01-77
Converse	03-01-76
Crook	01-01-79
Hot Springs	12-01-76
Johnson	11-01-79
Laramie	12-01-77
Lincoln	11-01-79
Natrona	12-01-74
Niobrara	12-01-76
Platte	12-01-76
Sheridan	01-01-79
Sweetwater	01-02-74
Teton	11-22-73
Uinta	07-01-76
Weston	09-01-75

3. Sales and Use Tax Transfers from State: The 1975 Legislative Session provided that one-third of the state sales tax and one-sixth of the use tax collections be distributed to counties, cities, and towns. The percentage distributed to each county is based on the percentage of sales and use tax collections in each county. Within each county, the tax disbursement is made according to the following formulas:

(a) For counties--$\frac{\text{Population Outside Incorporated City Limits}}{\text{Total Population of the County}}$

(b) For cities and towns--$\frac{\text{Population Inside Incorporated City Limits}}{\text{Total Population of the County}}$

In like manner, the entire proceeds from the 1 percent option tax for counties is distributed to counties, cities, and towns.

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[42]Department of Revenue and Taxation, 1982, op. cit.

4. Educational Fund Transfers From State: Transfers were estimated on the basis of per pupil payments for elementary and secondary students as follows:[43]

Elementary Number of Students	Transfer Payment/Student 1980
≥1000	$ 257.77
101-999	$1,288.85
≤100	$1,549.60

Secondary Number of Students	Transfer Payment/Student 1980
≥550	$ 704.36
151-549	$1,291.33
≤150	$1,589.33

5. Highway Fund Transfers From State: Transfers estimated in 1980 dollars as a per capita share of state highway taxes were:[44]

County share per capita = $15.32
Municipal share per capita = $ 6.92

6. Cigarette Tax Transfers From State: Transfers, in 1980 dollars, estimated as a per capita share of the state cigarette tax were:[45]

County share per capita = $1.42
Municipal share per capita = $9.88

7. Mineral Severance Tax Transfer From State: (See State Revenues, Mineral Severance Tax Section).

8. Federal Revenue Sharing Transfers: These were assumed equivalent to North Dakota's due to application of a national formula to two very similar states. Estimates made in 1980 dollars of average per capita transfers for counties and municipalities were:

Counties = $10.94 per capita
Municipalities = $ 6.65 per capita

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[43]Mottonen, Lois, Director of Fiscal Services, Personal Communication, State Department of Education, Cheyenne, Wyoming, January 1983; and Thompson, L. S. and W. D. Schultz, 1978, op. cit.

[44]Wyoming State Highway Department, "Current Fund: Assets, Budgeted Receipts, and Federal Aid Balances," Cheyenne, September 30, 1980.

[45]Department of Revenue and Taxation, 1982, op. cit.

9. User Fees: User fee revenues, estimated on the basis of average per household expenditures for water, sewer, and solid waste, are the same as used in North Dakota (i.e., $165.91 in 1980 dollars).

10. Special Assessments: Revenues from special assessments were estimated by amortizing the capital investments for streets, water, sewer, and solid wastes at 7 percent interest for 20 years.

Cost Estimation

The effect of an energy development project on local government costs is determined by a number of factors, with the extent of local population growth and level of excess capacity in local public service infrastructure being the most important. A description of cost calculations and cost estimating equations is presented below.

State Costs.

1. Educational Fund Transfers to School Districts: Cost to the state was estimated as the total of per pupil payments (see the local revenue, educational fund transfers from the state section).

2. Highway System Operating Expenditures: Increased operating costs for all highway department functions were estimated on a per capita basis to be $322.50 in 1980 dollars.[46]

3. General Government Functions: As in the North Dakota version, these costs were estimated to be $480.10 per capita in 1980 dollars.

4. Capital Investment in Highway System: Capital costs for highway improvement were estimated on the basis of a per in-migrating operating worker cost of $29,987 in 1980 prices, adjusted annually for inflation.[47]

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[46]Department of Revenue and Taxation, 1982, op. cit.

[47]Leistritz, et al., 1982, op. cit.

Local Costs.

1. Schools:

a. Operating expenditures were estimated as cost per pupil in 1980 prices where both elementary and secondary per pupil costs were estimated on the basis of the number of new secondary students as follows:[48]

Number of Additional High School Students	Per Pupil Cost
≥200	$1,504.90
150-199	$1,617.71
100-149	$1,811.84
75- 99	$2,123.68
51- 74	$2,554.29
≤ 50	$2,443.60

b. Expansion costs of school facilities in Wyoming were assumed to be equivalent to those in North Dakota, i.e., cost per student basis in 1980 dollars.[49]

2. Streets, Distribution and Treatment of Water, Waste-Water Systems and Treatment, and Solid Waste Disposal: Cost estimates for infrastructure were assumed to be equivalent to those in North Dakota's version.

3. Law Enforcement, Fire Protection, and Other Local Government Functions: Operational expenditures for municipal and county government functions were assumed to be equivalent to those in North Dakota. Cost estimates from regression equations in 1980 prices are:

County Social Services	$ 7.45
County Law Enforcement	$ 5.78
County Highway Maintenance	$ 29.02
County General Government	$ 94.86
City Fire Protection	$ 24.91
City Police Protection	$ 31.34
City General Government	$208.00

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[48]Mottonen, Lois, 1983, op. cit.; and Thompson, L. S. and W. D. Schultz, 1978, op. cit.

[49]Leistritz, et al., 1982, op. cit.

Evaluation of the Model

An important factor in determining a model's usefulness is its degree of reliability in simulating socioeconomic changes in the study region. Confidence in a given impact assessment model can be gained in three general ways: (1) critically assessing its theoretical basis, assumptions, data sources, and computational procedures; (2) investigating its response to perturbations; and (3) testing its ability to reproduce historical data.[50] Most impact assessment models, including NEDAM, have been subjected to the first two types of evaluation. The third general form, historical simulation, was used in evaluating the performance of the Wyoming version of NEDAM. This method involves choosing a past period for which the values of the variables estimated by the model are known. The model was provided with the historical values of the input variables and simulated over this period. The resultant values estimated by the model then were compared to the actual values by applying a number of statistical tests (including Theil's U_1 coefficient, mean absolute error, mean error, and R^2 coefficient)[51] to evaluate the "goodness of fit."

The NEDAM adaptation to Wyoming was evaluated by determining how closely the model reproduces historical personal income as reported by the Department of Commerce.[52] In brief review, the model estimates personal income for each

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[50]Leistritz, F. Larry, Steve H. Murdock, Donald M. Senechal, and Thor A. Hertsgaard, "Computerized Socioeconomic Impact Models: Usefulness and Limitations," paper presented at Conference on Computer Models for Forecasting Socioeconomic Impacts of Growth and Development, Jasper, Alberta, April 1980.

[51]Senechal, Donald M., "Analysis of Validity of North Dakota Input-Output Models," unpublished M.S. Thesis, Department of Agricultural Economics, North Dakota State University, Fargo, 1971; and Martinez Salazar, Angel S., "A Methodology for the Evaluation of the Economic-Demographic Simulation Models," Unpublished M.S. Thesis, Department of Agricultural Economics, North Dakota State University, Fargo, 1981.

[52]Bureau of Economic Analysis, Personal Income by Place of Residence, Wyoming, U.S. Department of Commerce, U.S. Government Printing Office, Washington, D.C., 1962, 1965-1980.

of the years (1960-1980) for the six regions and Wyoming using input-output techniques. The interdependence coefficients developed elsewhere in North Dakota[53] and northwestern Colorado[54] were applied to final demand vectors computed for the state or regions. These estimates of gross business volume (in the household sector row) for each economic sector (or column) were simply those levels of business activity generated by sales for final demand (i.e., exports). The gross business volume for the household sector, except for minor definitional differences, is equivalent to personal income. For each year, the total personal income generated in the region is the summation of personal incomes resulting from final sales (gross business volumes in the household sector row) by the column sectors.

The results of these calculations for each year were compared with estimates of personal income assembled by the Department of Commerce. These results for Wyoming and its six regions are presented in Table 19 (and Appendix B, Tables 55-60). The differences, expressed as percentages of the Department of Commerce estimates, indicate consistent patterns for each region and the state. A possible interpretation of this consistency is the interdependence coefficients were simulating the economy correctly, but sales for final demand vectors were either being over- or underestimated.

Statistical tests were used to evaluate performance of the model. Results of these tests are presented for all six regions and the state (Table 20). Absolute average difference indicated more variation at the regional level than for the state as a whole, with all but one of the regions having less than an 18 percent difference. The mean average difference indicated Regions 2, 3, and 5 were slightly underestimated while remaining regions were

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[53]Toman, et al., 1979, op. cit.; and Leistritz, et al., 1982 op. cit.

[54]Gray, et al., 1981, op. cit.

TABLE 19. ESTIMATES OF PERSONAL INCOME AND DIFFERENCES IN ESTIMATES, WYOMING REGION 1, 1960-1980 (THOUSAND DOLLARS)

Year	Department of Commerce Estimate	I-O Analysis Estimate	Percent Difference
1960	--	97,890	--
1961	--	92,340	--
1962	97,499	96,937	- 0.6
1963	--	120,021	--
1964	--	110,617	--
1965	107,004	114,381	6.9
1966	113,733	123,021	8.2
1967	121,467	122,914	1.2
1968	135,261	141,772	4.8
1969	159,495	161,250	1.1
1970	172,009	171,402	- 0.4
1971	181,072	179,635	- 0.8
1972	207,156	198,405	- 4.2
1973	232,417	268,832	15.7
1974	261,562	269,636	3.1
1975	313,506	289,097	- 7.8
1976	371,554	328,671	-11.5
1977	449,794	419,452	- 6.7
1978	541,247	519,918	- 3.9
1979	651,812	655,643	0.6
1980	749,601	806,675	7.6
Average Difference			5.0

Mean = .782 (S.D. = 6.691)
U_1 = .033

slightly overestimated. Wyoming personal income was underestimated by the adapted model by 6.4 percent during the 1960 to 1980 period. Standard deviations for the regions ranged from 5.97 to 21.13, and the state value was 5.50. Theil's coefficients for the regions ranged from .032 to .205, and the state value was .056. These values (all very close to 0.0) indicate the model performs quite well and can be used with confidence for predictive purposes.

Sales for final demand vectors for Region 2 have a significant downward bias. The divergence was consistent over the time period tested with the mean average difference being -28.0 percent. Underestimating sales for final demand for a region is quite possible when a major trade center is located within the

TABLE 20. COMPARISON OF STATISTICAL TESTS FOR E-D MODEL PERSONAL INCOME ESTIMATION, WYOMING REGIONS 1-6, AND STATE, FOR TIME PERIOD 1960-1980

Region	Average Absolute Difference[a]	Mean Average Difference[b]	Standard Deviation[c]	Theil Coefficient[d]
1	5.0%	0.8%	6.69	.032
2	28.0	-28.0	5.97	.205
3	9.6	- 6.8	8.52	.045
4	9.2	4.6	10.69	.035
5	17.5	- 1.2	21.13	.155
6	13.5	13.5	6.21	.066
State	7.3	- 6.4	5.50	.056

[a]Average absolute difference is the sum of the absolute values of the percent difference of I-O estimates and historic data divided by the number of observations.

[b]Mean average difference is the sum of the percent difference of the I-O estimate and historic data divided by the number of observations.

[c]Standard deviation is for the difference of the I-O estimate and historic data.

[d]Theil's coefficient calculated using the formula:

$$U_1 = \frac{\sqrt{\frac{1}{T}\Sigma(Y^s - Y^a)^2}}{\sqrt{\frac{1}{T}\Sigma(Y^s)^2} + \sqrt{\frac{1}{T}\Sigma(Y^a)^2}}$$

where: T = time period
Y^s = simulated value of Y
Y^a = actual value of Y

area, as is Casper in Region 2. Expenditures by residents of other regions, presumably in major trade centers, are made on those goods and services not available (perceived or actual) in their communities. Casper also serves as a major headquarters for the energy industry of Wyoming, and some Casper-based firms have operations in Colorado, Montana, and North Dakota as well. Energy industry expenditures to Casper could not all be captured in baseline export sales for final demand.

Personal income estimates for Region 3 also were underestimated with a mean average difference of -6.8 percent. Cheyenne, a major trade center located in this region, probably caused interregional spillover effects that resulted in the underestimation of Region 3. In addition, the possible

expansion of the Cheyenne trade area into Nebraska and Colorado contributed to the problem of determining the economic base.

The remaining four regions in Wyoming were estimated quite accurately.[55] Regions 1, 4, and 6 were slightly overestimated, and Region 5 was only slightly underestimated. Statistical tests on results from these four regions indicate the model accurately replicates the Wyoming economy. State level estimates of personal income showed a very small underestimation for the 1960-1980 time period. Average difference of personal income estimates from model and the Department of Commerce was 7.3 percent. This indicates the model was quite accurate for the time period checked. Underestimation at the state level was the result of the failure to capture all the economic bases of the Casper and Cheyenne major trade centers, especially trade coming from other states.

Although the input-output model invariably underestimates or overstates personal income, the adapted version does appear to "track" reasonably consistently with the Department of Commerce data. The results of the principle ex post forecasting error statistic, Theil's inequality coefficient, indicate that the adapted model predicts quite well.[56] In spite of the downward bias in the historical comparison, this evaluation does not negate the model for use in impact analysis in the two regions with major trade centers.

Analyzing the transition from historic data to corresponding model-projected values gives a good measure of model performance. Employment and

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[55]The mean of the average differences for the four regions is 11.3 percent.

[56]The average Theil U_1 coefficients for the six regions and the state were .090 and .056 respectively. This coefficient is a summary measure, bounded to the interval of 0 and 1. A value of 0 for U_1 indicates perfect prediction, while a value of 1 corresponds to perfect inequality (i.e., between the actual and predicted values). For further discussion on the Theil coefficient, see Leuthold, Raymond M., "On the Use of Theil's Inequality Coefficients," American Journal of Agricultural Economics, Vol. 57, No. 2, 1975, pp. 344-346; and Pindyck, Robert S. and Daniel L. Rubinfeld, Econometric Models and Economic Forecasts, Second Edition, McGraw-Hill, New York, 1981.

population data were available for evaluating model performance. Employment data for historic and projected time periods were allocated to the economic sectors. The model calculates projected employment by sector, giving values to be compared to the historic employment of each sector. The 1960 to 1980 employment by sector trends compare very well with the 1981 to 2005 projection of employment by sector. Sector employment values tended to show some variations for the 1980 to 1981 period, but regional totals of the projected values were quite close to historic employment levels (Table 21, and Appendix B, Tables 61 to 66).

Considerable changes have occurred in the Wyoming economic base since 1980, including expansion in the coal and oil industries and contraction and/or closure in the uranium industry. Project files were used to incorporate these developments (shutdowns) into the model. These projects are actually baseline projects, or projects that have occurred since 1980 in addition to projected baseline economic activity. Project employment was aggregated and is shown in Table 21 as project employment, rather than being broken down by sector. The coal mining sector employment shows a drop from 3,115 in 1980 to 2,255 in 1981, but realistically, much of the project-specific employment would be in the coal mining sector. Secondary employment from construction and operational phases of the project developments was allocated to the respective sectors.

Employment growth in Region 1 from 1980 to 1981 reflects the large amount of coal mine expansion and the Wheatland electric generating facility expansion during that time period. Region 4 also shows a large increase in employment from 1980 to 1981, with the Overthrust oil and gas activity being the significant development. The large increase in employment for the region is quite reasonable for the time period. An employment decrease occurred in Region 5 as a result of the decline in uranium mining. Small changes in employment from 1980 to 1981 occurred in Regions 2, 3, and 6 indicating no

TABLE 21. HISTORIC AND MODEL-PROJECTED EMPLOYMENT BY ECONOMIC SECTOR, WYOMING REGION 1, SELECTED YEARS 1960 TO 2005

Sector	Historic Employment			Model-Projected Employment			
	1960	1970	1980	1981	1990	2000	2005
(1) & (2) Agriculture	2,003	1,937	1,882	1,848	1,797	1,757	1,742
(3) Metal Mining	---	---	2	3	3	3	3
(4) Coal Mining	116	301	3,115	2,255	1,651	1,287	1,164
(5) Pet/NG Exp/Ext	1,386	2,944	2,577	2,536	2,730	2,871	2,924
(6) Nonmetallic Mining	89	116	442	496	564	664	713
(7) Construction	987	953	3,917	5,496	5,815	7,551	8,532
(8) Lumber	272	221	563	563	616	658	674
(9) Ag Proc & Misc Mfg	1,247	1,313	2,040	2,085	2,046	1,999	1,980
(10) Pet Refining	41	71	207	132	140	146	148
(11) Metal Proc	---	---	---	---	---	---	---
(12) Transportation	558	638	746	831	832	825	821
(13) Comm & Pub Util	628	747	949	1,049	1,072	1,072	1,071
(14) Elec Gen	179	84	143	155	139	129	126
(15) Retail	2,913	4,054	5,747	6,786	7,694	7,905	7,977
(16) F.I.R.E.	457	729	1,203	1,270	1,417	1,531	1,581
(17) Bus & Pers Service	844	1,264	2,274	2,491	2,905	3,293	3,473
(18) Prof & Soc Service	564	990	1,935	1,924	2,265	2,586	2,739
(19) Government	3,439	3,546	4,961	5,267	5,446	5,495	5,509
(20) Households	---	---	---	---	---	---	---
Project[a]	---	---	---	1,168	1,606	1,655	1,655
TOTAL	15,723	19,908	32,703	36,355	38,738	41,427	42,832

[a]Project employment includes only direct employment resulting from economic development in addition to the baseline economic activity since 1980. Developments impacting Region 1 include: north, middle, and south Campbell County coal mine expansion; Campbell County uranium growth; Carbon County uranium growth; and the Wheatland II 500 MW electric generating unit. Secondary employment resulting from these projects is allocated to the appropriate sectors and included in projected employment for the respective sectors.

major developments or declines. These data indicate the model captures the economic trends quite well with respect to employment and avoids the problem of unrealistic increases or decreases in employment at the point of transition from historic to model-projected employments. Data were not available for comparing the 2005 employment projections, but the model did perform very well in the early portion of the projection period.

Population projections made by the model also give a good indication of how the model is performing. Projected populations for 1985, 1990, 1995, 2000,

and 2005 were compared to the population values from the census for 1960, 1970, and 1980 (Table 22, and Appendix B, Tables 67 to 71). Projected populations

TABLE 22. HISTORIC POPULATION AND MODEL-PROJECTED POPULATION, BY CITY AND COUNTY, WYOMING REGION 1, BY SELECTED YEARS

County/City	Census Population			Model-Projected Population[a]				
	1960	1970	1980	1985	1990	1995	2000	2005
Campbell County	5,861	12,957	24,367	25,246	26,972	27,793	27,191	29,453
Gillette	3,580	7,194	12,134	13,909	15,957	16,795	15,999	17,481
Wright	0	0	1,200	1,522	1,478	1,350	1,228	1,140
Crook County	4,691	4,535	5,308	5,311	5,479	5,626	5,576	5,583
Hulett	335	318	291	277	266	256	236	220
Moorcraft	826	981	1,014	1,066	1,122	1,166	1,170	1,178
Sundance	908	1,056	1,087	1,105	1,154	1,196	1,193	1,203
Johnson County	5,475	5,587	6,700	6,959	7,215	7,365	7,351	7,433
Buffalo	2,907	3,394	3,799	3,890	4,043	4,188	4,238	4,343
Kaycee	284	272	271	263	254	241	223	211
Sheridan County	18,989	17,852	25,048	26,425	27,961	29,315	30,353	30,786
Clearmont	154	141	191	206	220	233	237	238
Dayton	333	396	701	755	806	855	908	941
Ranchester	235	208	655	705	754	802	851	909
Sheridan	11,651	10,865	15,146	16,313	17,429	18,483	19,488	19,882
Weston County	7,929	6,307	7,106	6,703	6,470	6,218	5,833	5,568
Newcastle	4,345	3,432	3,596	3,393	3,173	2,946	2,664	2,449
Osage[b]	250	250	250	243	238	232	220	212
Upton	1,224	987	1,193	1,168	1,138	1,101	1,034	991
REGION 1	42,945	47,238	68,529	70,644	74,098	76,316	76,305	78,824

[a]Based on a birthrate of 2.1 births per female, unallocated labor pool maximum = 0.07 and minimum = 0.01, family size for construction, energy operating, nonenergy operating, indirect, and baseline is 2.291, 3.535, 3.535, 2.170, and 2.170 respectively. The maximum fraction of city workers who can work on farms is 0.2, and the maximum fraction of rural workers who can work in cities is 0.2.

[b]Census populations were unavailable, so 1960, 1970, and 1980 population estimates were based on information provided by the county agent's office.

appear to fall in line quite well with the census numbers and follow a trend compatible with the historic populations. Employment increases due to project development are reflected in population growth in Regions 1 and 4. The model performs quite well in the early years, with estimates very close to the 1980 census population.

Conclusions and Implications

The conceptualization, design, development, and application of an integrated socioeconomic impact assessment model is clearly a formidable undertaking. The value of such modeling efforts is increased to the extent that they are applicable to other settings and to the extent that they provide, through the provision of timely and accurate information, useful inputs to the decision making process. This report has attempted to address such issues by examining the adaptability and validity of one such modeling system.

In general, the results reported here suggest that the model examined is adaptable to sparsely populated rural areas and appears to provide reliable projections of economic and demographic change. In contemplating future applications of this modeling system, however, potential users should carefully examine the assumptions inherent in the model's data base. In particular, the projected baseline sales to final demand for each region of interest and the specific development projects applicable to those regions should be carefully reviewed in light of recent events. While the assumptions concerning these factors currently incorporated in the model reflect the most current information available to the authors, the dynamic nature of resource development in general and of energy markets in particular requires frequent review of assumptions concerning such activities. Should revisions in these assumptions prove desirable for some regions, the model's structure provides for easy alteration of the appropriate data files.

In summary, models like the one described here are not a substitute for detailed understanding of local conditions, trends, and associated causal forces but rather offer a mechanism for operationalizing such knowledge. Thus, they have the potential to serve as powerful and flexible tools for planners and decision makers.

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APPENDIX A

PROCEDURES AND DATA SOURCES USED IN THE ECONOMIC MODULE

Essentially, the procedures and data sources used in the economic module apply to its central feature--an input-output model. This model tabulates and describes the linkages or interdependencies between various industrial groups or sectors within an economy. The input-output model assumes that the level of economic activity in a region is dependent upon its existing basic industries. These industries, which earn income from outside the region, are often termed the region's export base.

The general methods used in estimating and projecting economic activity from the NEDAM input-output model are as follows:

1. Final Demand Vectors: Data collection of sales for final demand by the region's basic economic sectors;
2. Derivation of Interdependence Coefficients: Indicates the direct, indirect, and induced requirements of the economy's sectors;
3. Estimation of Gross Business Volumes: Multiplication of final demand vectors by interdependence coefficients;
4. Productivity Ratios: Division of gross business volumes by sectoral employment;
5. Baseline Activity Projections: Historic final demand vectors and productivity ratios are projected by regression techniques with results indexed to 1980 base year dollars.

The purpose of this appendix is to discuss these various procedures and present the data sources used in adapting the NEDAM model to Wyoming. The discussion begins with an overview of the procedures used in expanding the input-output model for Wyoming. Following this, the section is divided into the various economic sectors with each containing relevant data sources and a discussion of how the final demand vectors were determined.

Input-Output Model--Interdependence Coefficients

Input-output technical and interdependence coefficients were available for southern Wyoming (Albany, Carbon, and Sweetwater counties)[1] and the Powder River Basin of northeastern Wyoming (Campbell, Converse, Crook, Johnson, Natrona, Niobrara, Sheridan, and Weston counties).[2] Sector delineation for the Wyoming coefficients was very different from that used for the original NEDAM model and NEDAM adaptation to Montana. Combining sectors under a broad definition, such as agriculture, oil/gas, or services, made estimating sales to final demand difficult. Although education and government sectors were broken down in great detail, they were of very little value to the model since they represent no sales for final demand. Another factor affecting the usefulness of the Wyoming coefficients was the failure to provide sectors for crops, petroleum refining, and lumber, all of which have sales for final demand. Because the effects of the input-output technical coefficients are reflected throughout the entire model, the North Dakota input-output interdependence coefficients were used for adaptation of NEDAM to Wyoming. These coefficients were checked to determine how well they represented the Wyoming economy (Table 19 of the text and Appendix B, Tables 55-60). The North Dakota interdependence coefficients were used successfully to replicate the Wyoming economy.[3]

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[1]McKean, John R. and Joseph C. Weber, The Economy of Albany, Carbon, and Sweetwater Counties, Wyoming--Description and Analysis, Technical Report No. 21, Colorado Water Resources Research Institute, Colorado State University, Fort Collins, January 1981.

[2]McKean, John R., J. C. Weber, and R. K. Ericson, The Economy of The Powder River Basin of Eastern Wyoming--Description and Analysis, Technical Report No. 36, Colorado Water Resources Research Institute, Colorado State University, Fort Collins, January 1981.

[3]See Table 18, page 50, in Chase, Robert A., R. C. Coon, C. L. Chase, C. F. Vocke, R. J. Vuchetich, F. L. Leistritz, T. A. Hertsgaard, W. Ransom-Nelson, S. H. Murdock, P. S. Yang, and R. Sharma, Expansion and Adaptation of the North Dakota Economic-Demographic Assessment Model (NEDAM) for Montana: Technical Description, Agricultural Economics Miscellaneous Report No. 61, Department of Agricultural Economics, North Dakota Agricultural Experiment Station, North Dakota State University, Fargo, January 1983.

The input-output technical and interdependence coefficients for the North Dakota economy were derived from actual expenditures data collected in 1965 for business firms, households, and units of government in southwestern North Dakota.[4] Energy-related sector coefficients were determined from survey data collected in 1976.[5] Three economic sectors were added to the model for Wyoming: metal mining, lumber and associated products, and metal processing. Sector delineation and associated Standard Industrial Classification (SIC) codes are presented in Table 3 of the text.

Similarities between the economic base of North Dakota and Wyoming allowed the transfer of input-output interdependence coefficients to Wyoming. Expanding the North Dakota model (17 economic sectors) to represent the Wyoming economy (20 economic sectors) was accomplished by obtaining technical and interdependence coefficients from a recent economic analysis of northwestern Colorado.[6] As in North Dakota, these coefficients were derived from actual expenditures data collected in 1974. Similarities between the metal mining, lumber, and metal processing industries in Wyoming and northwestern Colorado justified the use of these coefficients for Wyoming.

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[4]Sand, L. D., "Analysis of Effects of Income Changes In Intersectoral and Intercommunity Economic Structure," Unpublished M.S. Thesis, Department of Agricultural Economics, North Dakota State University, Fargo, 1968; Bartch, B. L., "Analysis of Intersectoral and Intercommunity Structure in Southwestern North Dakota," Unpublished M.S. Thesis, Department of Agricultural Economics, North Dakota State University, Fargo, 1968; and Senechal, D. M., "Analysis of Validity of North Dakota Input-Output Models," Unpublished M.S. Thesis, Department of Agricultural Economics, North Dakota State University, Fargo, 1971.

[5]Hertsgaard, T. A., Randal C. Coon, F. Larry Leistritz, and Norman L. Dalsted, Developing Economic Impact Projection Models for the Fort Union Coal Region, EPA-908/4-77-009, Environmental Protection Agency, Denver, Colorado, June 1977.

[6]Gray, S. L., J. R. McKean, and J. C. Weber, The Economy of Northwestern Colorado: Description and Analysis, Technical Report No. 25, Colorado Water Resources Research Institute, Colorado State University, Fort Collins, 1981.

The North Dakota input-output interdependence coefficients, originally for a 13-sector model, were calculated using the following formula:

$$([I - A]_{13 \times 13})^{-1}$$

where: $A_{13 \times 13}$ = Technical coefficients table for 13 sectors;

I = Identity matrix (a matrix consisting of all zeros with the exception of ones in the diagonal).

Survey expenditure data for the energy-related industries yielded technical coefficients for four additional economic sectors. These 17-sector interdependence coefficients were calculated as follows:

$$\left[([I - A]_{13 \times 13})^{-1}\right]^{-1} = [I - A]_{13 \times 13}$$

$$I - [I - A]_{13 \times 13} = A_{13 \times 13}$$

The original 13-sector technical coefficients table ($A_{13 \times 13}$) is expanded to $A_{13 \times 17}$ by adding zeros to the matrix.

$$[A]_{13 \times 17} + [A]_{4 \times 17} = [A]_{17 \times 17}$$

where: $[A]_{4 \times 17}$ = Energy sectors technical coefficients table;

$[A]_{17 \times 17}$ = 17-sector technical coefficients table.

Thus, $I - [A]_{17 \times 17} = [I - A]_{17 \times 17}$

and $\left[[I - A]_{17 \times 17}\right]^{-1}$ = Interdependence coefficients for 17 sectors.

Similar methods were used to expand the North Dakota 17-sector input-ouput model to 20 economic sectors for Wyoming. The technical coefficients for Wyoming's 20-sector economy are presented in Table 4 of the text. Inverting the 20 X 20 technical coefficents matrix for Wyoming yielded the interdependence coefficients (Table 5 of the text).

Indexing

In order to reflect the <u>real</u> economic growth or decline of various sectors over time, the effects of economy-wide inflation must be controlled.

Inflation was removed from final demand vectors by utilizing a price index. The Implicit Price Index (IMP) was selected for this indexing (deflating) approach and used to calculate 1980 base dollar values. The use of the IMP as a deflator assumes that a single index was applicable for all sectors of the economy for a given year. The method is rather simple--dividing current year dollars by their respective IMP resulted in final demand vector values in 1980 base year dollars. Implicit price indices for 1960 to 1980 are presented in Appendix Table 1.[7]

Removing inflation from the final demand vectors also reflects real change in productivity ratios. Gross business volumes estimated from 1980 base final demand vectors are subsequently used in calculating productivity ratios. Thus, all economic baseline data in the economic model are expressed in terms of 1980 dollars.

Regression Techniques

Projecting final demand vectors and productivity ratios was done with regression analysis. A great number of regression analysis techniques exist to fit a projection equation (line) from the existing data. A data set can be fit with a straight line (linear regression) or with a curved line (log, quadratic, etc.). Linear regression is more acceptable for economic-demographic model projections as curvilinear regression equations often show very rapid changes in certain portions of their curves. Curvilinear regression equations tend to make projecting models act rather erratic.

The data in the Wyoming extension of NEDAM did not always yield acceptable linear regression equations (very low R^2 values) for model projections. To obtain more acceptable linear regression equations, a

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[7]U.S. Department of Commerce, Survey of Current Business, U.S. Government Printing Office, Washington, D.C., various issues.

APPENDIX TABLE 1. GROSS NATIONAL PRODUCT IMPLICIT PRICE DEFLATORS FOR 1967 AND 1980 BASE

Year	GNP Implicit Price Deflators	
	1967 = 100	1980 = 100
1960	86.9	38.74
1961	87.7	39.10
1962	89.3	39.81
1963	90.7	40.44
1964	92.0	41.02
1965	94.1	41.95
1966	97.1	43.29
1967	100.0	44.58
1968	104.4	46.54
1969	109.8	48.95
1970	115.7	51.58
1971	121.4	54.12
1972	126.5	56.40
1973	133.7	59.61
1974	145.4	64.82
1975	158.8	70.80
1976	167.1	74.50
1977	176.9	78.87
1978	189.8	84.62
1979	205.9	91.80
1980	224.3	100.00

Source: U.S. Department of Commerce, Survey of Current Business, U.S. Government Printing Office, Washington, D.C., several issues.

regression technique called robust regression was used. Robust regression is a technique where observations near the regression line are weighted higher than those lying a substantial distance away from the line (for a complete description of robust regression, see Leistritz, et al., North Dakota Economic-Demographic Assessment Model (NEDAM): Technical Description, 1982). In addition to robust regression, a robust regression technique with an intercept adjustment was utilized.

The three regression techniques for projecting final demand vectors and productivity ratios were determined, projections were calculated, and the three sets of numbers were incorporated into the model. The results indicated

the regression with an intercept adjustment gave more realistic overall employment projections over the entire six regions in Wyoming than the other techniques (Appendix Table 2). The 1981 projected employment was very close to

APPENDIX TABLE 2. HISTORIC EMPLOYMENT AND PROJECTED EMPLOYMENT RESULTING FROM THREE REGRESSION TECHNIQUES, BY REGION, 1980 AND 1981

		Projected Employment					
		Regular Regression		Robust Regression		Robust Regression with Adjustment	
Region	Historic 1980 Employment	1981 Employment	% Diff.	1981 Employment	% Diff.	1981 Employment[a]	% Diff.
1	32,703	25,858	- 20.9	21,985	-32.8	36,355	11.2
2	46,696	36,157	- 22.6	36,673	-21.5	46,273	- 0.9
3	64,144	406,744	534.1	42,187	-34.2	64,919	1.2
4	32,855	22,816	- 30.6	29,042	-11.6	41,086	25.1
5	23,199	19,541	- 15.8	20,330	-12.4	21,097	- 9.1
6	23,404	20,801	- 11.1	17,520	-25.1	24,015	2.6

[a]Includes baseline economic activity and project direct and secondary employment.

the 1980 historic robust employment for all six Wyoming regions indicating the regression equations were predicting quite well in the early part of the projection period. Data were not available for analyzing the projections toward the end of the projection period.

Final Demand Vectors

Final demand vectors are sales for final demand by various sectors of the economy. Sectors included as final demand vectors in input-output analysis are referred to as "basic sectors" because they constitute the economic base of the area. The activities that constitute the "basic sectors" in the Wyoming economy include the production of livestock, crops, mining, lumber, and manufacturing within the area, as well as expenditures by the federal government and tourists in the area.

Final demand vectors were calculated for the period 1960 through 1980 at the regional level for Wyoming. Six economic regions were used for calculating the economic base in Wyoming (Figure 1 of the text). Basic sector final demand vectors were deflated using the IMP and projected to the year 2005 using linear regression techniques.

Data used in estimating the final demand vectors for the basic sectors in Wyoming were obtained from a wide variety of secondary sources and compiled at county and regional levels. The sources of data and methodology are described below for the basic economic sectors.

Agriculture, Livestock (Sector 1)

The agriculture, livestock final demand vector consists of total receipts from sale of livestock and livestock products. Livestock production data were published each year from 1960 to 1980 at the county level for Wyoming.[8] State estimates of livestock income also were available for the 1960 to 1980 time period.[9] Annual livestock sales for Wyoming were allocated to counties according to their portion of total state livestock production for each year during the time period. Wyoming's regional final demand vectors were obtained by adding livestock sales receipts for counties in each of the six regions.

Agriculture, Crops (Sector 2)

Total receipts for crops and government agricultural payments comprise the agriculture, crops final demand vector. Crop production data were

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[8]Wyoming Crop and Livestock Reporting Service, Wyoming Agricultural Statistics, Wyoming Department of Agriculture cooperating with U.S. Department of Agriculture, Cheyenne, annual reports, 1961-1981.

[9]Ibid.

published annually for Wyoming at the county level for 1960 through 1980.[10] Crop sales and government payments for 1960 to 1980 also were available for Wyoming.[11] Annual county share of state value of production for major commodities was used to allocate Wyoming's crop sales plus government payments to counties. The total crops receipts and government payments for each county in the region were added to obtain final demand vectors for each of Wyoming's six regions.

Metal Mining (Sector 3)

The metal mining final demand vector consists of value of sales of raw metals exported from the producing region. Major metals mined in Wyoming include: uranium, iron ore, and gold. Values of metals mined were available by county for each metal.[12] Metals not processed in Wyoming were assumed to be exported as a raw material. Metal processing was a small industry in Wyoming, except for the partial processing of iron ore. Because of the partial processing of iron ore before it was shipped from Wyoming, it was included in the metal processing sector. The values of metal exports were calculated, and county values were aggregated to the regional level.

Coal Mining (Sector 4)

The total receipts from sales of coal to customers located outside the region comprise the coal mining final demand vector. Production by county and value per ton were available for 1960 through 1980.[13]

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[10]Ibid.

[11]Ibid.

[12]Goodier, John T., D. S. Hoffman, and Helen Gilbert, Wyoming Mineral Yearbook, Mineral Division, State Department of Economic Planning and Development, Cheyenne, annual reports 1960-1981.

[13]Ibid.

Nonlocal sales of coal were assumed to be 75 percent of total production.[14] County coal exports were summed to the regional level to determine Wyoming's regional coal final demand vector.

Petroleum and Natural Gas Exploration and Extraction (Sector 5)

Export sales of petroleum and natural gas from the local region constituted the final demand vector for Sector 5. Wyoming's crude oil production (in barrels) and value of production were available by county for 1960 through 1980.[15] Also available were natural gas production (in million cubic feet) and value of production by county.[16] The regional exports of crude oil and natural gas constituted sales for final demand. Data on exports of crude oil and natural gas from Wyoming were not readily available, but estimates were obtained from Wyoming officials.[17] Three-fourths of the crude oil production in Wyoming was assumed to be exported for refining, and 85 percent of the natural gas production was exported. County petroleum and natural gas exports were aggregated to the regional level to obtain petroleum and natural gas exploration and extraction sales for final demand.

Nonmetallic Mining (Sector 6)

Total receipts from the nonlocal sales of nonmetallic minerals comprised the nonmetallic mining final demand vector. Nonmetallic mining in Wyoming included the following minerals: bentonite, trona, cement, feldspar, gypsum, lime, sand and gravel, and sulfur. County production and value of

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[14]Goodier, John T., unpublished data, Department of Economic Planning and Development, Cheyenne, August 1982.

[15]Goodier, John T., 1960-1980, op. cit.

[16]Goodier, John T., 1960-1980, op. cit.

[17]Goodier, John T., 1982, op. cit.

production of the nonmetallic minerals was available for the years 1960 to 1980.[18] Data on exports of raw ore nonmetallic minerals were not readily available; therefore, production not processed in Wyoming was assumed exported.[19] All nonmetallic mineral production was assumed to be exported. County value of production was summed to the regional level to determine the nonmetallic mining final demand vector.

Contract Construction (Sector 7)

The construction industry generates sales to final demand primarily in the form of highway construction funded by federal government revenues. The amount of federal expenditures for highway construction was available only at the state level for Wyoming between 1960 and 1966.[20] The procedure for reporting these data changed in 1967, and actual federal expenditures for Wyoming were available at county and state level from 1967 to 1980.[21] Federal government outlays for construction in the respective regions for 1960 to 1966 were estimated by allocating state totals on the basis of regional shares reported for 1967 to 1980.

Lumber and Associated Products (Sector 8)

Total receipts from nonlocal sales of lumber and associated products constituted the final demand vector for Sector 8. County lumber production

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[18]Goodier, John T., 1960-1980, op. cit.

[19]Bureau of Mines, Minerals Yearbook, Area Reports: Domestic, Volume II, United States Department of the Interior, U.S. Government Printing Office, Washington, D.C., 1960-1980.

[20]U.S. Treasury Department, Annual Report of the Secretary of the Treasury on the State of the Finances, U.S. Government Printing Office, Washington, D.C., 1960-1966.

[21]Office of Economic Opportunity, Federal Outlays in Wyoming, National Technical Information Service, U.S. Department of Commerce, Washington, D.C., 1967-1980.

and value of Wyoming lumber production were available for 1960 to 1980.[22] Approximately 95 percent of the lumber cut in Wyoming is exported out of the producing region.[23]

Value of production was applied to county yield to obtain county value of production. County nonlocal sales of lumber and associated products were added to the regional level to obtain Wyoming's regional lumber and associated products final demand vector.

Agricultural Processing and Miscellaneous Manufacturing (Sector 9)

Gross output of the agricultural processing and miscellaneous manufacturing sector consists principally of the value of miscellaneous manufacturing, much of which is food processing. Also included in this sector are wholesaling activities, although they are rather small. State or county level data were not readily available for this sector. Personal income data for manufacturing and wholesale trade were available for North Dakota and Wyoming.[24] Values of agricultural processing and miscellaneous manufacturing

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[22]Western Wood Products Association, 1980 Statistical Yearbook of the Western Lumber Industry, Western Wood Products Association Economic Services Department, Portland, Oregon, 1981; Keegan, Charles E., III, Montana's Forest Products Industry: A Descriptive Analysis, Bureau of Business and Economic Research, University of Montana, Missoula, April 1980; and Schuster, Ervin G., Montana's Timber Harvest and Timber-Using Industry: A Study of Relationships, Bulletin 41, Montana Forest and Conservation Experiment Station, School of Forestry, University of Montana, Missoula, December 1978.

[23]Keegan, Charles E., III, and Randel V. White, "Wyoming Forest Products Industry," Wyoming Issues, Volume 2, No. 4, Institute for Policy Research, College of Commerce and Industry and College of Arts and Sciences, University of Wyoming, Laramie, Fall 1979; and Keegan, Charles E., III, Research Assistant, Bureau of Business and Economic Research, University of Montana, Missoula, December 1982, telephone interview.

[24]U.S. Department of Commerce, Bureau of Economic Analysis, Personal Income by Major Sources--North Dakota, Regional Economics Information System, U.S. Government Printing Office, Washington, D.C., 1959, 1962, 1965-1979; and U.S. Department of Commerce, Bureau of Economic Analysis, Personal Income by Major Sources--Wyoming, Regional Economics Information System, U.S. Government Printing Office, Washington, D.C., 1959, 1962, 1965-1979.

data were published at the state level for North Dakota.[25] The ratio of personal income for manufacturing and wholesale trade to sales for final demand for agricultural processing and miscellaneous manufacturing was calculated for North Dakota. The ratio was applied to Wyoming personal income from manufacturing and wholesale trade to calculate agricultural processing and miscellaneous manufacturing final demand vectors at the county level. Regional final demand vectors for this sector were obtained by aggregating county data.

Petroleum Refining (Sector 10)

Export sales of refined petroleum products were calculated for the petroleum refining sector. Wyoming data were available on petroleum refining capacities for 1960 to 1980.[26] Refineries were assumed to operate at full capacity. An average value[27] for each barrel of refined petroleum was determined and assigned to production to obtain total value of refined petroleum products. Data on exports of refined petroleum products from Wyoming were not readily available, but an estimate of 70 percent being sold nonlocally was used.[28] Regional petroleum refining final demand vectors were obtained by summing county values of refined petroleum sold nonlocally.

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[25]Greater North Dakota Association, New Wealth--North Dakota, North Dakota State Chamber of Commerce, Fargo, 1958-1980.

[26]"Survey of Operating Refineries In The United States," Annual Refining Report, Oil & Gas Journal, PennWell Publication Co., Tulsa, Oklahoma, 1960-1981.

[27]Foster Associates, Inc. United States Average Wholesale Prices of Crude Oil and Petroleum Products in Eight Refining Markets, Prospective Regional Markets for Coal Conversion Plant Products Projected to 1980 and 1985, prepared for Office of Coal Research, U.S. Department of the Interior, Washington, D.C., September 1974; and U.S. Department of Commerce, "Price Indexes," Survey of Current Business, U.S. Government Printing Office, Washington, D.C., August 1981.

[28]Goodier, John T., 1982, op. cit.

Metal Processing (Sector 11)

Sales of processed metals outside the local region constituted the metal processing final demand vector. A small amount of metal processing occurs in Wyoming. The only metal processed was iron ore, which was partially processed before being shipped out of state. Amount of iron ore processed and its processed value were available by county for 1960 through 1980.[29] All processed iron ore was assumed to be sold out of the processing region. County value of metal processing was determined and summed to the regional level to estimate the metal processing final demand vector.

Thermal-Electrical Generation (Sector 14)

Nonlocal sales of electricity generated by burning coal constituted the thermal-electric generating final demand vector. Locations and capacities of generating facilities were available from 1960 to 1980.[30] Data on total annual electricity generated at the state level also were available for that period.[31] Total annual electricity generated was allocated to the state regions on the basis of generating capacity. Total value of electricity generated was calculated by applying the price to electricity generated.[32]

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[29]Goodier, John T., 1960-1980, op. cit.

[30]Gillian, Lucinda R., Inventory of Power Plants in the United States--December 1979, DOE/EIA-0095(79), Office of Coal and Electrical Power Statistics, Electric Power Statistics Division, Energy Information Administration, U.S. Department of Energy, U.S. Government Printing Office, Washington, D.C., June 1980.

[31]Bureau of the Census, "Electric Energy--Production and Installed Generating Capacity, By State," Statistical Abstract of the United States, U.S. Department of Commerce, U.S. Government Printing Office, Washington, D.C., 1960-1981.

[32]Steele, Lynda, Historical Energy Statistics, 4th Edition, Energy Division, Department of Natural Resources and Conservation, Helena, Montana, October, 1980.

Estimates of electricity exported from Wyoming were applied to regional value of production giving sales for final demand at the regional level.[33]

Retail Trade (Sector 15)

The retail trade final demand vector consists of three-fourths of the dollar volume of tourism expenditures in the area. The other one-fourth is assumed to be the business and personal service final demand vector. State level tourism estimates were available for 1970 to 1980.[34] Wyoming's tourism expenditures were available for 1981 at the county level.[35] Trend estimates were obtained to backcast the 1970 value to 1960.[36] County share of state tourism for 1981 was used to allocate tourism expenditures in Wyoming to the individual counties for 1960 to 1980. County tourism estimates were added to the regional level and three-fourths of that value yielded the retail trade final demand vector.

Business and Personal Services (Sector 17)

The final demand vector for business and personal services is simply the remaining tourism expenditures (25 percent) after allocation to retail trade.

Households (Sector 20)

The federal government generates basic income to the household sector through payrolls and transfer payments. Federal aid to states and individuals

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[33]Goodier, John T., 1982, op. cit.

[34]Wyoming Travel Commission, News of Big Wyoming, Cheyenne, 1972-1981.

[35]U.S. Travel Data Center, The Economic Impact of Travel on Wyoming Counties, 1981, a Study Prepared for the Wyoming Travel Commission, Washington, D.C., July 1982.

[36]Wyoming Travel Commission, 1972-1981, op. cit.

was published annually for Wyoming for 1960 to 1967.[37] Defense expenditures, veterans benefits, Old Age and Survivor's Insurance payments, Workman's Compensation, and the federal payroll also were included as basic income.[38] The household sector final demand vectors for Wyoming were calculated by adding total grants (less highway construction), defense expenditures (except for construction), veterans benefits, Old Age and Survivor's Insurance, Workman's Compensation, and federal payrolls.

Total federal expenditures were available on a county basis for 1967 to 1980 for Wyoming.[39] The final demand vector for 1967 to 1980 was calculated as follows: farm payments (included as income in Sector 2), construction outlays, and loans were subtracted from the total federal expenditures to obtain final demand vectors at county and state levels. The regional percentage of the state expenditures during the period 1967 to 1980 was used to allocate the household final demand vector to the regions for 1960 to 1966.

Employment

Wyoming's employment data were available at the state and county levels for 1960 to 1980.[40] County employment data were disaggregated to the economic

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[37]U.S. Treasury Department, 1960-1968, op. cit.

[38]Bureau of Economic Analysis, Personal Income by Place of Residence, Wyoming, U.S. Department of Commerce, U.S. Government Printing Office, Washington, D.C., 1958-1967.

[39]U.S. Department of Commerce, 1967-1980, op. cit.

[40]Wyoming Employment Security Commission, Wyoming Annual Planning Report, Wyoming Annual Labor Force, prepared by Research and Analysis Section, Casper, 1960-1982.

sectors by creating allocators from County Business Patterns.[41] County employment was summed to the regional level to yield regional employment by sector for 1960 to 1980.

[41]U.S. Department of Commerce, Bureau of the Census, County Business Patterns, Wyoming, U.S. Government Printing Office, Washington, D.C., 1960-1979.

APPENDIX B

TABLES FOR REGIONS 2-6 AND THE STATE OF WYOMING

APPENDIX TABLE 1. COMMUNITIES FOR INCLUSION IN THE WYOMING ECONOMIC-DEMOGRAPHIC MODEL AND THEIR POPULATIONS, BY COUNTY AND REGION, 1960, 1970, AND 1980

Region	County		City		Population		
	Number	Name	Number	Name	1960	1970	1980
1	1	Campbell	1	Gillette	3,580	7,194	12,134
			2	Wright*[a]	0	0	1,200
	2	Crook	3	Hulett	335	318	291
			4	Moorcraft	826	981	1,014
			5	Sundance	908	1,056	1,087
	3	Johnson	6	Buffalo	2,907	3,394	3,799
			7	Kaycee	284	272	271
	4	Sheridan	8	Clearmont	154	141	191
			9	Dayton	333	396	701
			10	Ranchester	235	208	655
			11	Sheridan	11,651	10,865	15,146
	5	Weston	12	Newcastle	4,345	3,432	3,596
			13	Osage*[b]	250	250	250
			14	Upton	1,224	987	1,193
2	6	Converse	15	Douglas	2,822	2,677	6,030
			16	Glenrock	1,584	1,515	2,736
	7	Natrona	17	Alcova*[b]	100	100	200
			18	Casper	38,930	39,361	51,016
			19	Edgerton	512	350	510
			20	Evansville	678	832	2,652
			21	Midwest[c]	--	--	638
			22	Mills	1,477	1,724	2,139
	8	Niobrara	23	Lusk	1,890	1,495	1,650
			24	Lance Creek*[b]	90	90	90
			25	Manville	124	92	94
3	9	Albany	26	Laramie	17,520	23,143	24,410
			27	Rock River	497	344	415
	10	Carbon	28	Baggs	199	146	433
			29	Dixon	108	72	82
			30	Elk Mountain	190	127	338
			31	Encampment	333	321	611
			32	Hanna	625	460	2,288
			33	Medicine Bow	392	455	953
			34	Rawlins	8,968	7,855	11,547
			35	Riverside	87	46	55
			36	Saratoga	1,133	1,181	2,410
			37	Sinclair	621	445	586
	11	Goshen	38	Fort Laramie	233	197	356
			39	LaGrange	176	189	232
			40	Lingle	437	446	475
			41	Torrington	4,188	4,237	5,441
			42	Yoder	83	101	110

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APPENDIX TABLE 1. COMMUNITIES FOR INCLUSION IN THE WYOMING ECONOMIC-DEMOGRAPHIC MODEL AND THEIR POPULATIONS, BY COUNTY AND REGION, 1960, 1970, AND 1980 (CONTINUED)

Region	County Number	County Name	City Number	City Name	Population 1960	Population 1970	Population 1980
	12	Laramie	43	Albin	172	118	128
			44	Burns	225	185	268
			45	Carpenter*[b]	50	50	50
			46	Cheyenne	43,505	41,273	47,264
			47	Federal*[b]	10	10	10
			48	Horse Creek*[b]	15	15	15
			49	Pine Bluffs	1,121	937	1,077
	13	Platte	50	Chugwater	287	187	282
			51	Glendo	292	210	367
			52	Guernsey	800	793	1,512
			53	Hartville	177	246	149
			54	Wheatland	2,350	2,498	5,816
4	14	Lincoln	55	Afton	1,337	1,290	1,481
			56	Cokeville	545	445	515
			57	Diamondville	398	485	1,000
			58	Kemmerer	2,028	2,292	3,273
			59	LaBarge[d]	--	--	302
			60	Thayne	214	195	256
	15	Sublette	61	Big Piney	663	570	530
			62	Marbleton	189	223	537
			63	Pinedale	965	948	1,066
	16	Sweetwater	64	Eden*[b]	50	50	50
			65	Granger	159	137	177
			66	Green River	3,497	4,196	12,807
			67	Rock Springs	10,371	11,657	19,458
			68	South Superior	401	197	586
			69	Wamsutter	110	139	681
	17	Uinta	70	Evanston	4,901	4,462	6,421
			71	Lyman	425	643	2,284
			72	Mountain View[e]	1,721	--	628
5	18	Fremont	73	Dubois	574	898	1,067
			74	Hudson	369	381	514
			75	Jeffrey City*[f]	--	--	825
			76	Lander	4,182	7,125	9,126
			77	Pavillion	190	181	287
			78	Riverton	6,845	7,995	9,588
			79	Shoshoni	766	562	879
	19	Teton	80	Jackson	1,437	2,688	4,511
6	20	Big Horn	81	Basin	1,319	1,145	1,349
			82	Byron	417	397	633
			83	Cowley	459	366	455
			84	Deaver	121	112	178

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APPENDIX TABLE 1. COMMUNITIES FOR INCLUSION IN THE WYOMING ECONOMIC-DEMOGRAPHIC MODEL AND THEIR POPULATIONS, BY COUNTY AND REGION, 1960, 1970, AND 1980 (CONTINUED)

Region	County Number	County Name	City Number	City Name	Population 1960	Population 1970	Population 1980
			85	Frannie	171	139	138
			86	Greybull	2,286	1,953	2,277
			87	Lovell	2,451	2,371	2,447
			88	Manderson	167	117	174
	21	Hot Springs	89	East Thermopolis	281	316	359
			90	Kirby	82	75	129
			91	Thermopolis	3,955	3,063	3,852
	22	Park	92	Cody	4,838	5,161	6,790
			93	Meeteetse	514	459	512
			94	Powell	4,740	4,807	5,310
	23	Washakie	95	Ten Sleep	314	320	407
			96	Worland	5,806	5,055	6,391
		South Dakota	97	Belle Forche	4,087	4,236	4,692
			98	Custer	2,105	1,597	1,830
			99	Edgemont	1,772	1,174	1,468
			100	Lead	6,211	5,420	4,330
			101	Rapid City	42,399	43,836	46,492
			102	Spearfish	3,682	4,661	5,251
		Nebraska	103	Crawford	1,588	1,291	1,315
			104	Gering	4,585	5,639	7,760
			105	Harrison	448	377	361
			106	Kimball	4,384	3,680	3,120
			107	Mitchell	1,920	1,842	1,956
			108	Scottsbluff	13,377	14,507	14,156
		Colorado	109	Boulder	37,718	66,870	76,685
			110	Craig	3,984	4,205	8,133
			111	Denver	493,887	514,678	491,396
			112	Fort Collins	25,027	43,337	64,632
			113	Fort Morgan	7,379	7,594	8,768
			114	Greeley	26,314	38,902	53,006
			115	Longmont	11,489	23,209	42,942
			116	Loveland	9,734	16,220	30,244
			117	Steamboat Springs	1,843	2,340	5,098
			118	Walden	809	907	947
		Utah	119	Coalville	907	864	1,037
			120	Garden City	168	134	266
			121	Logan	18,731	22,333	26,871
			122	Ogden	70,197	69,478	64,444

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APPENDIX TABLE 1. COMMUNITIES FOR INCLUSION IN THE WYOMING ECONOMIC-DEMOGRAPHIC MODEL AND THEIR POPULATIONS, BY COUNTY AND REGION, 1960, 1970, AND 1980 (CONTINUED)

Region	County		City		Population		
	Number	Name	Number	Name	1960	1970	1980
			123	Salt Lake City	189,454	175,885	162,985
			124	Vernal	3,655	3,908	6,603
			125	Woodruff	169	173	224
		Idaho	126	Idaho Falls	33,161	35,776	39,590
			127	Monteplier	3,146	2,604	3,114
			128	Rexburg	4,767	8,272	11,559
			129	St. Anthony	2,700	2,877	3,202
			130	Soda Springs	2,424	2,977	4,041
			131	Swan Valley	217	235	135
			132	Tetonia	194	176	191
			133	Victor	240	241	324
		Montana	134	Billings	52,851	61,581	66,798
			135	Bozeman	13,361	18,670	21,645
			136	Broadus	628	799	712
			137	Decker[g]	35	35	35
			138	Hardin	2,789	2,733	3,300
			139	Laurel	4,601	4,454	5,481
			140	Livingston	8,229	6,883	6,994
			141	Red Lodge	2,278	1,844	1,896
			142	West Yellowstone	--	756	735

*Unincorporated municipality as reported by 1980 census data.
[a]Regional growth rates were used to determine municipality populations when unavailable for calculating nonagricultural municipality allocators. Estimated 1960 and 1970 populations of Wright were 752 and 827, respectively.
[b]Estimated 1960, 1970, and 1980 population based on information provided by county agent's office from each municipality's respective county.
[c]Regional growth rates were used to determine municipality populations when unavailable for calculating nonagricultural municipality allocators. Estimated 1960 and 1970 populations of Midwest were 429 and 432, respectively.
[d]Regional growth rates were used to determine municipality populations when unavailable for calculating nonagricultural municipality allocators. Estimated 1960 and 1970 populations of LaBarge were 161 and 164, respectively.
[e]Linear interpolation was used to determine the 1970 population. Estimated 1970 population of Mountain View was 1,175.
[f]Regional growth rates were used to determine municipality populations when unavailable for calculating nonagricultural municipality allocators. Estimated 1960 and 1970 populations of Jeffrey City were 486 and 552, respectively.
[g]Estimated 1960, 1970, and 1980 population based on enumeration district data provided by Montana State Census Data Center; Billings, Montana.

APPENDIX TABLE 2. SALES FOR FINAL DEMAND, BY ECONOMIC SECTOR, WYOMING REGION 2, 1960-1980, (1980 = BASE DOLLARS), MILLION DOLLARS

	Sector							
Year	(1) Ag, Lvstk	(2) Ag, Crops	(3) Metal Mining	(4) Coal Mining	(5) Pet/NG Exp/Ext	(6) Nonmetallic Mining	(7) Constr	(8) Lumber
1960	48.0	3.0	3.8	1.0	97.1	0.6	9.2	0.6
1961	44.4	2.6	1.5	1.6	85.3	0.2	9.0	0.6
1962	45.7	3.2	2.1	1.5	83.2	0.3	9.5	0.6
1963	44.0	3.3	2.6	1.9	87.7	0.2	13.1	0.6
1964	41.9	2.7	1.1	1.8	96.0	0.1	12.1	0.6
1965	46.9	2.9	3.6	2.2	104.3	0.8	15.7	0.6
1966	55.3	3.3	0.8	2.7	101.2	0.1	12.1	0.7
1967	48.5	3.4	0.2	2.4	103.1	0.1	11.4	0.7
1968	54.8	3.1	0.6	2.1	96.9	0.1	3.9	0.9
1969	56.9	3.3	0.6	2.0	91.8	0.2	9.8	0.9
1970	54.5	3.6	1.4	1.9	83.7	0.3	11.6	0.7
1971	58.6	3.3	1.2	1.9	83.5	0.3	13.2	1.1
1972	69.8	4.2	4.9	3.0	74.7	0.4	11.2	1.2
1973	84.6	6.4	10.3	3.2	112.9	0.4	6.5	1.2
1974	57.0	4.5	8.9	4.3	190.6	0.5	1.2	0.9
1975	57.5	4.1	4.2	7.4	205.8	0.6	12.9	0.7
1976	57.8	5.3	3.5	8.9	170.2	0.6	8.0	1.2
1977	66.5	3.9	14.0	4.5	169.9	0.7	10.2	1.2
1978	78.5	4.0	15.1	9.2	175.1	0.8	14.9	1.3
1979	96.1	3.9	19.1	10.7	205.4	0.9	9.0	1.2
1980	73.8	3.6	22.4	10.6	303.0	0.9	20.2	1.4

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APPENDIX TABLE 2. SALES FOR FINAL DEMAND, BY ECONOMIC SECTOR, WYOMING REGION 2, 1960-1980, (1980 = BASE DOLLARS), MILLION DOLLARS (CONTINUED)

	Sector						
Year	(9) Ag Proc & Misc Mfg	(10) Pet Refining	(11) Metal Proc	(14) Elec Gen	(15) Retail Trade	(17) Bus & Pers Service	(20) Households
1960	52.8	118.3	--	16.9	39.8	13.2	63.6
1961	53.4	118.4	--	23.3	43.5	14.6	59.5
1962	53.5	151.7	--	23.1	46.5	15.6	61.7
1963	51.0	144.9	--	24.6	50.0	16.6	101.3
1964	48.7	141.8	--	33.4	53.6	17.8	78.3
1965	46.0	143.4	--	33.4	57.7	19.3	67.9
1966	44.7	138.9	--	38.0	62.6	20.8	70.0
1967	42.0	111.9	--	37.1	67.7	22.7	76.0
1968	42.1	113.5	--	27.2	73.5	24.5	78.8
1969	43.4	137.1	--	32.1	79.7	26.6	80.7
1970	46.0	138.8	--	37.2	87.0	29.1	77.4
1971	49.1	144.3	--	25.1	87.2	29.0	74.6
1972	50.1	147.9	--	45.3	90.2	30.1	76.4
1973	52.3	167.3	--	65.3	88.7	29.5	103.5
1974	58.1	321.0	--	51.4	83.5	27.8	84.3
1975	66.2	372.3	--	47.7	81.5	27.1	106.6
1976	74.7	376.1	--	49.5	82.8	27.7	111.4
1977	85.9	386.5	--	64.7	82.8	27.6	116.4
1978	84.6	385.2	--	58.5	84.8	28.2	123.5
1979	83.7	503.6	--	57.2	89.9	30.0	145.1
1980	81.1	733.0	--	50.2	92.9	31.0	127.5

APPENDIX TABLE 3. SALES FOR FINAL DEMAND, BY ECONOMIC SECTOR, WYOMING REGION 3, 1960-1980, (1980 = BASE DOLLARS), MILLION DOLLARS

	Sector							
Year	(1) Ag, Lvstk	(2) Ag, Crops	(3) Metal Mining	(4) Coal Mining	(5) Pet/NG Exp/Ext	(6) Nonmetallic Mining	(7) Constr	(8) Lumber
1960	95.2	50.9	1.8	0.6	17.6	0.8	22.4	3.0
1961	90.9	51.0	9.6	1.4	16.4	0.8	21.9	3.0
1962	98.3	41.1	8.9	1.8	16.8	0.7	23.2	3.0
1963	87.6	45.1	6.3	2.1	18.1	0.8	32.0	3.0
1964	81.0	37.7	3.7	1.8	16.9	1.1	29.5	3.0
1965	87.1	27.7	6.3	1.6	16.6	0.8	38.3	2.9
1966	104.2	39.8	1.3	1.7	15.8	0.7	29.4	4.0
1967	98.0	41.6	3.2	1.6	15.9	0.6	27.8	3.3
1968	107.2	42.2	3.9	1.6	16.5	1.5	30.4	4.4
1969	110.6	40.4	5.5	1.9	14.9	1.7	35.3	5.0
1970	103.4	43.3	10.1	5.3	13.6	2.8	29.4	4.1
1971	111.7	38.2	16.3	6.1	12.2	3.5	24.2	5.4
1972	138.8	60.6	20.1	12.3	11.3	3.8	20.1	7.5
1973	151.7	83.4	14.7	25.7	12.6	3.7	23.4	9.2
1974	98.3	83.9	7.1	42.0	15.5	4.2	15.2	5.8
1975	100.5	67.7	10.3	79.9	15.2	4.5	63.3	4.2
1976	108.5	48.7	20.8	83.9	18.9	4.5	12.2	7.2
1977	129.2	40.7	29.0	106.9	20.8	5.1	17.9	7.6
1978	148.3	43.3	40.9	129.8	24.5	5.5	20.7	8.3
1979	184.9	53.1	31.9	128.7	49.9	7.2	45.0	7.9
1980	143.4	57.9	31.3	115.8	122.0	8.3	20.2	7.9

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APPENDIX TABLE 3. SALES FOR FINAL DEMAND, BY ECONOMIC SECTOR, WYOMING REGION 3, 1960-1980, (1980 = BASE DOLLARS), MILLION DOLLARS (CONTINUED)

	Sector						
Year	(9) Ag Proc & Misc Mfg	(10) Pet Refining	(11) Metal Proc	(14) Elec Gen	(15) Retail Trade	(17) Bus & Pers Service	(20) Households
1960	49.4	112.7	3.2	--	56.5	18.8	216.1
1961	48.8	111.7	4.2	--	61.9	20.7	202.0
1962	47.9	108.5	2.8	--	66.6	22.1	209.6
1963	47.3	105.7	3.0	--	71.5	23.7	344.1
1964	46.8	102.6	3.7	--	76.3	25.4	266.0
1965	45.9	97.1	3.3	--	82.5	27.4	230.5
1966	44.8	94.0	3.4	--	89.2	29.8	237.8
1967	50.1	92.5	3.2	--	96.7	32.3	258.1
1968	42.0	91.5	3.1	--	104.6	34.8	241.4
1969	42.7	87.3	3.8	--	113.8	38.0	238.3
1970	43.0	106.7	4.0	--	124.1	41.3	244.9
1971	42.2	108.1	3.6	--	124.5	41.6	251.3
1972	47.5	107.9	3.6	--	128.7	42.9	291.3
1973	52.5	117.1	2.8	--	126.7	42.3	515.1
1974	57.8	237.4	2.8	--	119.1	39.6	346.4
1975	59.6	293.1	3.0	--	116.2	38.7	325.8
1976	61.7	308.5	3.1	--	118.3	39.5	347.1
1977	61.5	316.3	2.5	--	118.2	39.4	378.9
1978	69.2	309.7	2.9	--	121.1	40.4	398.7
1979	71.9	397.7	2.8	--	128.2	42.8	428.9
1980	72.8	608.7	1.5	33.4	132.6	44.2	408.5

APPENDIX TABLE 4. SALES FOR FINAL DEMAND, BY ECONOMIC SECTOR, WYOMING REGION 4, 1960-1980, (1980 = BASE DOLLARS), MILLION DOLLARS

	Sector							
Year	(1) Ag, Lvstk	(2) Ag, Crops	(3) Metal Mining	(4) Coal Mining	(5) Pet/NG Exp/Ext	(6) Nonmetallic Mining	(7) Constr	(8) Lumber
1960	48.8	3.8	--	1.9	81.3	6.1	9.8	6.8
1961	43.1	3.9	--	2.0	109.5	5.0	9.6	6.8
1962	46.1	4.1	--	1.8	97.5	6.6	10.1	6.9
1963	41.8	2.9	--	2.0	97.1	7.3	13.9	6.8
1964	42.2	4.0	--	2.2	100.9	8.7	12.9	6.8
1965	48.7	5.1	--	2.3	94.4	10.1	16.7	6.9
1966	54.9	5.4	--	2.5	89.6	11.8	12.6	7.4
1967	50.2	4.3	--	2.5	86.7	12.3	12.1	7.7
1968	54.6	4.1	--	2.7	85.6	16.0	18.9	9.6
1969	57.2	3.9	--	4.3	93.4	22.5	10.3	10.9
1970	52.4	4.4	--	5.7	90.3	29.7	7.1	9.1
1971	55.5	4.0	--	6.3	89.0	28.8	4.3	12.0
1972	66.7	5.0	--	7.8	83.0	32.3	19.1	12.5
1973	77.0	9.1	--	13.8	94.5	40.2	8.7	15.6
1974	53.8	5.8	--	23.0	122.4	53.7	9.1	9.7
1975	56.1	6.0	--	30.2	149.6	64.7	9.2	9.1
1976	54.9	7.4	--	55.7	198.3	84.7	10.0	12.0
1977	60.9	5.4	--	76.0	232.4	100.9	10.3	16.7
1978	71.1	5.2	--	80.2	278.3	94.7	14.4	15.6
1979	82.1	6.1	--	107.4	403.7	119.2	6.6	14.5
1980	63.5	6.4	--	146.6	622.2	139.7	6.8	8.6

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APPENDIX TABLE 4. SALES FOR FINAL DEMAND, BY ECONOMIC SECTOR, WYOMING REGION 4, 1960-1980, (1980 = BASE DOLLARS), MILLION DOLLARS (CONTINUED)

	Sector						
Year	(9) Ag Proc & Misc Mfg	(10) Pet Refining	(11) Metal Proc	(14) Elec Gen	(15) Retail Trade	(17) Bus & Pers Service	(20) Households
1960	8.2	--	--	--	45.9	15.2	47.3
1961	9.3	--	--	--	50.1	16.6	44.2
1962	10.4	--	--	--	54.0	18.1	45.9
1963	9.3	--	--	17.6	57.9	19.3	75.4
1964	8.2	--	--	11.9	61.9	20.7	58.3
1965	7.2	--	--	11.9	67.0	22.4	50.5
1966	7.5	--	--	13.6	72.3	24.3	52.1
1967	7.8	--	--	13.2	78.5	26.2	56.5
1968	8.8	--	--	23.5	85.1	28.4	55.6
1969	10.3	--	--	27.7	92.3	30.8	59.9
1970	10.6	--	--	32.2	100.8	33.5	60.8
1971	11.3	0.3	--	39.6	101.1	33.6	61.6
1972	11.3	0.6	--	43.6	104.4	34.8	58.2
1973	14.3	0.1	--	62.9	102.8	34.2	79.6
1974	20.6	1.2	--	83.8	96.6	32.2	60.4
1975	18.2	2.6	--	109.4	94.4	31.5	71.2
1976	20.3	16.1	--	146.8	96.0	31.9	74.6
1977	21.4	3.5	--	191.7	95.9	32.0	92.9
1978	22.4	4.9	--	173.4	98.3	32.7	102.2
1979	25.1	8.1	--	207.5	104.0	34.6	95.9
1980	28.9	7.0	--	182.0	107.6	35.9	106.3

APPENDIX TABLE 5. SALES FOR FINAL DEMAND, BY ECONOMIC SECTOR, WYOMING REGION 5, 1960-1980, (1980 = BASE DOLLARS), MILLION DOLLARS

	Sector							
Year	(1) Ag, Lvstk	(2) Ag, Crops	(3) Metal Mining	(4) Coal Mining	(5) Pet/NG Exp/Ext	(6) Nonmetallic Mining	(7) Constr	(8) Lumber
1960	27.8	8.4	16.5	--	65.8	0.1	5.1	5.6
1961	10.9	8.4	16.4	--	64.1	--	5.0	5.5
1962	29.0	7.3	16.3	--	59.5	0.1	5.3	5.6
1963	26.4	8.4	18.6	--	56.0	0.1	7.3	5.6
1964	25.3	8.8	16.7	--	56.1	0.1	6.8	5.6
1965	29.3	7.8	13.9	--	56.3	0.1	8.8	5.8
1966	33.5	7.9	15.8	--	53.7	0.1	6.7	6.2
1967	31.3	7.7	16.2	--	57.2	0.1	6.4	7.2
1968	33.2	7.6	17.5	--	53.9	--	6.8	8.2
1969	32.4	8.7	17.6	--	50.4	0.2	3.6	10.9
1970	30.4	6.7	23.0	--	50.2	0.2	5.5	7.5
1971	32.6	7.3	16.9	--	50.5	0.2	7.2	7.3
1972	40.0	6.3	22.4	--	48.9	0.3	0.6	8.3
1973	46.9	7.4	16.1	--	48.5	0.3	1.0	10.4
1974	28.7	5.8	14.1	--	57.5	0.3	4.9	6.4
1975	31.0	6.7	14.9	--	51.6	0.3	4.8	6.0
1976	31.6	7.5	31.9	--	60.9	0.4	7.1	8.0
1977	37.5	6.1	41.0	--	91.1	0.3	4.4	11.1
1978	40.0	6.2	30.5	--	86.5	0.2	5.6	10.4
1979	46.8	6.0	23.2	--	124.4	0.3	17.0	9.7
1980	37.7	7.0	26.6	--	147.5	17.6	12.4	5.7

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APPENDIX TABLE 5. SALES FOR FINAL DEMAND, BY ECONOMIC SECTOR, WYOMING REGION 5, 1960-1980, (1980 = BASE DOLLARS), MILLION DOLLARS (CONTINUED)

	Sector						
Year	(9) Ag Proc & Misc Mfg	(10) Pet Refining	(11) Metal Proc	(14) Elec Gen	(15) Retail Trade	(17) Bus & Pers Service	(20) Households
1960	6.4	--	11.0	--	40.3	13.4	48.2
1961	6.5	--	10.9	--	44.0	14.6	45.1
1962	6.4	--	10.9	--	47.5	15.8	46.8
1963	6.5	--	12.4	--	50.9	17.1	76.8
1964	6.7	--	11.2	--	54.4	18.3	59.4
1965	6.7	--	9.3	--	58.9	19.5	51.5
1966	7.3	--	10.5	--	63.5	21.3	53.1
1967	7.6	--	10.8	--	68.9	22.9	57.6
1968	8.4	--	11.7	--	74.6	24.9	84.9
1969	9.2	--	11.7	--	81.1	27.0	85.1
1970	10.2	--	10.5	--	88.4	29.5	73.2
1971	9.9	--	10.3	--	88.7	29.6	62.6
1972	9.9	--	12.2	--	91.8	30.7	61.1
1973	10.1	--	13.4	--	88.6	30.0	71.5
1974	10.3	--	15.9	--	84.9	28.2	67.5
1975	11.2	--	18.1	--	82.8	27.5	60.3
1976	12.1	--	19.1	--	84.3	28.1	68.7
1977	15.0	--	19.8	--	84.2	28.0	86.1
1978	17.0	--	17.3	--	86.4	28.8	67.3
1979	17.9	--	15.6	--	91.4	30.5	63.7
1980	17.7	--	17.1	--	94.5	31.5	70.3

APPENDIX TABLE 6. SALES FOR FINAL DEMAND, BY ECONOMIC SECTOR, WYOMING REGION 6, 1960-1980, (1980 = BASE DOLLARS), MILLION DOLLARS

	Sector							
Year	(1) Ag, Lvstk	(2) Ag, Crops	(3) Metal Mining	(4) Coal Mining	(5) Pet/NG Exp/Ext	(6) Nonmetallic Mining	(7) Constr	(8) Lumber
1960	47.5	33.5	--	--	277.5	0.6	5.7	1.5
1961	44.4	33.1	--	--	281.5	0.7	5.6	1.5
1962	46.4	25.1	--	--	273.5	1.0	5.9	1.5
1963	44.3	36.2	--	--	264.9	1.0	8.1	1.5
1964	42.5	35.6	--	--	256.2	1.2	7.5	1.5
1965	51.5	31.1	--	--	238.3	1.6	9.7	1.3
1966	61.0	37.1	--	--	227.7	1.7	7.5	2.3
1967	53.2	36.7	--	--	225.7	1.3	7.1	1.6
1968	57.2	43.8	--	--	226.9	1.8	7.3	2.3
1969	57.2	39.7	--	--	219.6	2.2	3.4	3.0
1970	51.6	36.5	--	--	197.6	2.4	5.0	2.7
1971	53.5	45.1	--	--	194.7	2.0	6.5	2.9
1972	65.1	40.0	--	--	176.0	2.1	4.7	3.8
1973	75.1	63.0	--	--	187.3	2.4	4.5	5.6
1974	53.4	82.6	--	--	279.7	3.4	5.1	3.2
1975	52.1	51.9	--	--	306.5	3.6	12.0	2.0
1976	57.7	45.5	--	--	306.2	4.4	4.7	3.7
1977	68.5	38.4	--	--	297.8	5.3	6.6	4.0
1978	81.9	46.6	--	--	300.3	5.9	11.5	4.5
1979	98.3	45.2	--	0.1	322.3	7.8	5.3	4.1
1980	79.3	50.6	--	0.2	610.2	6.2	12.0	3.8

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APPENDIX TABLE 6. SALES FOR FINAL DEMAND, BY ECONOMIC SECTOR, WYOMING REGION 6, 1960-1980, (1980 = BASE DOLLARS), MILLION DOLLARS (CONTINUED)

	Sector						
Year	(9) Ag Proc & Misc Mfg	(10) Pet Refining	(11) Metal Proc	(14) Elec Gen	(15) Retail Trade	(17) Bus & Pers Service	(20) Households
1960	17.8	28.5	--	--	21.2	7.0	44.8
1961	18.2	32.2	--	--	23.0	7.7	41.8
1962	18.3	31.3	--	--	24.9	8.3	43.4
1963	18.8	29.4	--	--	26.7	8.9	71.3
1964	19.2	31.1	--	--	28.5	9.5	55.1
1965	19.5	31.6	--	--	30.8	10.3	47.8
1966	19.7	30.6	--	--	33.3	11.1	49.3
1967	19.7	34.3	--	--	36.1	12.1	53.5
1968	20.9	22.9	--	--	39.1	13.1	56.1
1969	21.4	22.1	--	--	42.5	14.1	53.2
1970	21.3	22.4	--	--	46.1	15.3	56.7
1971	21.2	22.5	--	--	46.4	15.5	60.0
1972	22.4	22.2	--	--	47.9	16.0	61.9
1973	24.1	24.1	--	--	47.1	15.8	74.6
1974	25.6	43.7	--	--	44.3	14.8	60.9
1975	28.6	43.4	--	--	43.2	14.4	73.6
1976	31.5	45.9	--	--	44.0	14.6	73.8
1977	32.8	52.0	--	--	44.0	14.7	80.3
1978	35.2	50.4	--	--	45.1	15.0	83.9
1979	36.3	64.2	--	--	47.8	15.9	86.2
1980	35.8	97.8	--	--	49.4	16.5	91.3

APPENDIX TABLE 7. SALES FOR FINAL DEMAND, BY ECONOMIC SECTOR, WYOMING, 1960-1980, (1980 = BASE DOLLARS), MILLION DOLLARS

	Sector							
Year	(1) Ag, Lvstk	(2) Ag, Crops	(3) Metal Mining	(4) Coal Mining	(5) Pet/NG Exp/Ext	(6) Nonmetallic Mining	(7) Constr	(8) Lumber
1960	351.2	108.5	22.1	5.7	642.3	12.6	67.5	22.5
1961	308.3	105.5	27.5	7.0	664.4	10.8	66.0	22.3
1962	340.6	93.0	27.3	7.2	629.5	12.7	69.7	22.5
1963	316.8	109.1	27.5	8.2	625.2	13.4	96.2	22.4
1964	304.8	99.3	21.6	8.2	640.5	15.8	88.9	22.4
1965	345.8	83.9	23.8	8.1	628.9	18.2	115.2	22.4
1966	403.2	103.4	17.9	8.7	600.1	19.0	88.6	26.8
1967	362.1	105.5	19.7	8.3	591.4	25.8	83.7	25.8
1968	399.7	109.1	22.0	8.3	610.8	22.6	88.3	32.5
1969	407.5	103.9	23.7	10.1	665.3	30.5	82.8	38.4
1970	379.2	102.3	34.5	18.6	657.8	39.0	74.0	30.4
1971	402.7	105.4	34.3	21.1	636.9	37.8	66.1	37.4
1972	495.0	125.7	47.4	26.9	582.9	42.3	79.5	45.8
1973	569.9	187.6	41.1	46.0	690.1	52.7	57.8	56.7
1974	381.0	194.7	30.1	81.8	1,049.2	68.6	52.0	35.3
1975	386.6	149.2	29.4	132.1	1,053.8	78.5	137.7	29.1
1976	413.8	128.5	56.1	183.9	1,084.2	100.6	54.0	44.1
1977	484.2	106.6	84.0	279.3	1,190.7	118.7	62.9	53.1
1978	555.0	116.2	86.5	362.4	1,239.9	115.3	77.2	53.5
1979	670.7	124.1	75.5	467.9	1,472.3	146.2	98.5	50.4
1980	524.3	133.7	81.0	580.2	2,310.2	180.9	101.1	40.8

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APPENDIX TABLE 7. SALES FOR FINAL DEMAND, BY ECONOMIC SECTOR, WYOMING, 1960-1980, (1980 = BASE DOLLARS), MILLION DOLLARS (CONTINUED)

	Sector						
Year	(9) Ag Proc & Misc Mfg	(10) Pet Refining	(11) Metal Proc	(14) Elec Gen	(15) Retail Trade	(17) Bus & Pers Service	(20) Households
1960	147.6	273.4	14.2	24.4	219.2	72.8	470.8
1961	149.2	276.1	15.1	28.5	239.4	79.5	440.2
1962	149.4	305.5	13.7	28.2	257.7	85.9	456.7
1963	145.9	293.6	15.5	47.6	276.5	92.0	749.8
1964	142.7	292.8	14.8	49.0	295.8	98.8	579.6
1965	138.4	289.5	12.6	49.1	319.4	106.6	502.3
1966	137.5	279.9	14.0	55.8	345.4	115.3	518.1
1967	141.1	254.8	14.0	54.3	374.4	124.9	562.4
1968	136.0	243.7	14.7	53.7	405.7	135.4	582.4
1969	141.3	260.1	15.5	64.7	440.7	146.9	583.1
1970	144.6	280.7	14.5	75.2	480.6	160.0	580.1
1971	147.9	288.6	13.9	68.5	482.1	160.8	578.4
1972	155.7	292.5	15.9	93.1	498.4	166.1	610.4
1973	169.4	324.6	16.1	134.3	490.4	163.4	942.0
1974	189.0	642.5	18.5	140.0	461.0	153.7	691.1
1975	204.0	754.0	21.2	161.5	450.0	149.9	707.2
1976	222.7	791.2	22.2	201.0	457.7	152.5	751.7
1977	240.5	821.9	22.3	262.5	457.5	152.5	837.4
1978	254.3	811.9	20.2	263.1	469.0	156.3	874.5
1979	263.8	1,051.8	18.4	295.2	496.5	165.6	924.6
1980	267.4	1,559.9	18.6	292.3	513.4	171.2	916.5

APPENDIX TABLE 8. REGRESSION EQUATIONS[a] FOR PROJECTING FINAL DEMAND VECTORS FOR THE 20-SECTOR I-O MODEL, WYOMING REGION 2, (1980 = BASE DOLLARS), THOUSAND DOLLARS

Sector	Equation
(1) Ag, Livestock	Y = -2,730,608 + 1,422.35(X)
(2) Ag, Crops	Y = -119,000 + 62.10(X)
(3) Metal Mining	Y = 15,300.0[b]
(4) Coal Mining	Y = -844,586 + 432.13(X)
(5) Pet/NG Exp/Ext	Y = -11,373,170 + 5,865.02(X)
(6) Nonmetallic Mining	Y = -82,941 + 42.37(X)
(7) Construction	Y = -11,271 + 13.13(X)
(8) Lumber	Y = -82,745 + 42.49(X)
(9) Ag Proc & Misc Mfg	Y = -3,546,140 + 1,834.82(X)
(10) Pet Refining	Y = -33,770,770 + 17,346.5(X)
(11) Metal Processing	Y = 0[c]
(12) Transportation	Y = 0[c]
(13) Comm & Public Utilities	Y = 0[c]
(14) Electric Generation	Y = -3,734,626 + 1,916.04(X)
(15) Retail	Y = -4,935,374 + 2,540.23(X)
(16) Fin, Ins, Real Estate	Y = 0[c]
(17) Bus & Pers Service	Y = -1,641,102 + 844.71(X)
(18) Prof & Soc Service	Y = 0[c]
(19) Government	Y = 0[c]
(20) Households	Y = -6,789,681 + 3,499.35(X)

[a]Robust regression with an intercept adjustment technique.
[b]Metal mining final demand vector was set at a constant so the decline in the industry could be reflected with project files.
[c]An economic sector having no sales for final demand.

APPENDIX TABLE 9. REGRESSION EQUATIONS[a] FOR PROJECTING FINAL DEMAND VECTORS FOR THE 20-SECTOR I-O MODEL, WYOMING REGION 3, (1980 = BASE DOLLARS), THOUSAND DOLLARS

Sector	Equation
(1) Ag, Livestock	Y = -4,798,179 + 2,506.09(X)
(2) Ag, Crops	Y = 882,202 + 472.01(X)
(3) Metal Mining	Y = 23,500.0[b]
(4) Coal Mining	Y = -13,185,750 + 6,729.28(X)
(5) Pet/NG Exp/Ext	Y = -3,493,825 + 1,827.01(X)[c]
(6) Nonmetallic Mining	Y = -588,952 + 301.29(X)
(7) Construction	Y = 61,732.03 - 17.27(X)[d]
(8) Lumber	Y = -583,943 + 299.28(X)
(9) Ag Proc & Misc Mfg	Y = -2,339,703 + 1,218.91(X)
(10) Pet Refining	Y = -26,781,540 + 13,761.5(X)
(11) Metal Processing	Y = 78,872.5 - 38.42(X)[e]
(12) Transportation	Y = 0[f]
(13) Comm & Public Utilities	Y = 0[f]
(14) Electric Generation	Y = 33,400[g]
(15) Retail	Y = -7,041,684 + 3,624.36(X)
(16) Fin, Ins, Real Estate	Y = 0[f]
(17) Bus & Pers Service	Y = -2,355,758 + 1,212.45(X)
(18) Prof & Soc Service	Y = 0[f]
(19) Government	Y = 0[f]
(20) Households	Y = -21,078,720 + 10,864.9(X)

[a]Robust regression with an intercept adjustment technique.
[b]Metal mining final demand vector was set at a constant so the decline in the industry could be reflected with project files.
[c]Ordinary least-squares regression with an intercept adjustment technique was used because of the nature of the data.
[d]Ordinary least-squares regression technique was used because of the nature of the data.
[e]Robust regression technique.
[f]An economic sector having no sales for final demand.
[g]Projected sales for final demand assumed to continue at 1980 level.

APPENDIX TABLE 10. REGRESSION EQUATIONS[a] FOR PROJECTING FINAL DEMAND VECTORS FOR THE 20-SECTOR I-O MODEL, WYOMING REGION 4, (1980 = BASE DOLLARS), THOUSAND DOLLARS

Sector	Equation
(1) Ag, Livestock	Y = -2,301,900 + 1,200.27(X)
(2) Ag, Crops	Y = -241,746 + 125.20(X)
(3) Metal Mining	Y = 0[b]
(4) Coal Mining	Y = -8,943,605 + 4,577.86(X)
(5) Pet/NG Exp/Ext	Y = -28,837,010 + 14,877.53(X)[c]
(6) Nonmetallic Mining	Y = -11,717,220 + 5,983.36(X)
(7) Construction	Y = 377,293 - 186.06(X)
(8) Lumber	Y = -951,216 + 487.42(X)
(9) Ag Proc & Misc Mfg	Y = -1,862,039 + 954.25(X)
(10) Pet Refining	Y = -552,415 + 282.65(X)
(11) Metal Processing	Y = 0[b]
(12) Transportation	Y = 0[b]
(13) Comm & Public Utilities	Y = 0[b]
(14) Electric Generation	Y = -20,307,980 + 10,361.8(X)
(15) Retail	Y = -5,721,315 + 2,944.7(X)
(16) Fin, Ins, Real Estate	Y = 0[b]
(17) Bus & Pers Service	Y = -1,903,465 + 979.71(X)
(18) Prof & Soc Service	Y = 0[b]
(19) Government	Y = 0[b]
(20) Households	Y = -5,138,195 + 2,648.97(X)

[a]Robust regression with an intercept adjustment technique.
[b]An economic sector having no sales for final demand.
[c]Ordinary least-squares regression with an intercept adjustment technique was used because of the nature of the data.

APPENDIX TABLE 11. REGRESSION EQUATIONS[a] FOR PROJECTING FINAL DEMAND VECTORS FOR THE 20-SECTOR I-O MODEL, WYOMING REGION 5, (1980 = BASE DOLLARS), THOUSAND DOLLARS

Sector	Equation
(1) Ag, Livestock	Y = -1,038,388 + 545.95(X)
(2) Ag, Crops	Y = 252,424 - 124.38(X)
(3) Metal Mining	Y = 19,900.0[b]
(4) Coal Mining	Y = 0[c]
(5) Pet/NG Exp/Ext	Y = -4,494,875 + 2,345.32(X)[d]
(6) Nonmetallic Mining	Y = -25,813 + 16.10(X)
(7) Construction	Y = -147,575 - 68.71(X)
(8) Lumber	Y = -513,928 + 264.17(X)
(9) Ag Proc & Misc Mfg	Y = -1,078,337 + 554.03(X)
(10) Pet Refining	Y = 0[c]
(11) Metal Processing	Y = -773,346 + 399.40(X)
(12) Transportation	Y = 0[c]
(13) Comm & Public Utilities	Y = 0[c]
(14) Electric Generation	Y = 0[c]
(15) Retail	Y = -5,009,387 + 2,578.44(X)
(16) Fin, Ins, Real Estate	Y = 0[c]
(17) Bus & Pers Service	Y = -1,669,191 + 859.18(X)
(18) Prof & Soc Service	Y = 0[c]
(19) Government	Y = 0[c]
(20) Households	Y = -2,248,188 + 1,170.52(X)

[a]Robust regression with an intercept adjustment technique.
[b]Metal mining final demand vector was set to a constant so the decline in the industry could be reflected with project files.
[c]An economic sector having no sales for final demand.
[d]Ordinary least-squares regression with an intercept adjustment technique was used because of the nature of the data.

APPENDIX TABLE 12. REGRESSION EQUATIONS[a] FOR PROJECTING FINAL DEMAND VECTORS FOR THE 20-SECTOR I-O MODEL, WYOMING REGION 6, (1980 = BASE DOLLARS), THOUSAND DOLLARS

Sector	Equation
(1) Ag, Livestock	Y = -3,023,647 + 1,572.37(X)
(2) Ag, Crops	Y = -1,578,053 + 821.80(X)
(3) Metal Mining	Y = 0[b]
(4) Coal Mining	Y = 200[c]
(5) Pet/NG Exp/Ext	Y = -3,350,876 + 1,942.27(X)
(6) Nonmetallic Mining	Y = -474,871 + 243.43(X)
(7) Construction	Y = -81,803 + 46.21(X)
(8) Lumber	Y = -303,268 + 155.41(X)
(9) Ag Proc & Misc Mfg	Y = -1,850,592 + 953.67(X)
(10) Pet Refining	Y = -2,230,345 + 1,163.37(X)
(11) Metal Processing	Y = 0[b]
(12) Transportation	Y = 0[b]
(13) Comm & Public Utilities	Y = 0[b]
(14) Electric Generation	Y = 0[b]
(15) Retail	Y = -2,609,693 + 1,343.34(X)
(16) Fin, Ins, Real Estate	Y = 0[b]
(17) Bus & Pers Service	Y = -870,106 + 447.88(X)
(18) Prof & Soc Service	Y = 0[b]
(19) Government	Y = 0[b]
(20) Households	Y = -4,659,572 + 2,399.75

[a]Robust regression with an intercept adjustment technique.
[b]An economic sector having no sales for final demand.
[c]Projected sales for final demand are assumed to continue at 1980 level.

APPENDIX TABLE 13. REGRESSION EQUATIONS[a] FOR PROJECTING FINAL DEMAND VECTORS FOR THE 20-SECTOR I-O MODEL, WYOMING, (1980 = BASE DOLLARS), THOUSAND DOLLARS

Sector	Equation
(1) Ag, Livestock	Y = -18,347,060 + 9,570.48(X)
(2) Ag, Crops	Y = -2,701,262 + 1,428.68(X)
(3) Metal Mining	Y = -5,772,534 + 2,959.32(X)
(4) Coal Mining	Y = -2,712,968 + 1,609.27(X)
(5) Pet/NG Exp/Ext	Y = -69,765,090 + 36,116.9(X)
(6) Nonmetallic Mining	Y = -12,407,990 + 6,347.55(X)
(7) Construction	Y = 363.411 - 137.08(X)
(8) Lumber	Y = -3,099,773 + 1,591.49(X)
(9) Ag Proc & Misc Mfg	Y = -12,307,480 + 6,354.56(X)
(10) Pet Refining	Y = -68,189,260 + 35,050.8(X)
(11) Metal Processing	Y = -655,431 + 341.0(X)
(12) Transportation	Y = 0[b]
(13) Comm & Public Utilities	Y = 0[b]
(14) Electric Generation	Y = -26,782,420 + 13,683.5(X)
(15) Retail	Y = -27,262,110 + 14,031.9(X)
(16) Fin, Ins, Real Estate	Y = 0[b]
(17) Bus & Pers Service	Y = -9,094,550 + 4,680.95(X)
(18) Prof & Soc Service	Y = 0[b]
(19) Government	Y = 0[b]
(20) Households	Y = -45,488,980 + 23,455.1(X)

[a]Robust regression with an intercept adjustment technique.
[b]An economic sector having no sales for final demand.

APPENDIX TABLE 14. PROJECTED FINAL DEMAND VECTORS FOR BASIC ECONOMIC SECTORS, WYOMING REGION 2, 1981, 1985, 1990, 1995, 2000, AND 2005, (1980 = BASE DOLLARS), MILLION DOLLARS

Sector	1981	1985	1990	1995	2000	2005
(1) Ag, Livestock	85.6	91.3	98.5	105.6	112.7	119.8
(2) Ag, Crops	4.0	4.2	4.5	4.8	5.1	5.5
(3) Metal Mining	15.3	15.3	15.3	15.3	15.3	15.3
(4) Coal Mining	11.0	12.8	14.9	17.1	19.2	21.4
(5) Pet/NG Exp/Ext	239.6	263.0	292.4	321.7	351.0	380.3
(6) Nonmetallic Mining	1.0	1.1	1.3	1.5	1.8	2.0
(7) Construction	14.7	14.8	14.9	14.9	15.0	15.0
(8) Lumber & Assoc Prod	1.4	1.6	1.8	2.0	2.2	2.4
(9) Ag Proc & Misc Mfg	86.8	94.1	103.3	112.5	121.7	130.8
(10) Pet Refining	575.3	644.7	731.4	818.2	904.9	991.6
(11) Metal Processing	--	--	--	--	--	--
(14) Electric Generation	59.1	66.8	76.4	86.0	95.5	105.1
(15) Retail	94.3	104.4	117.1	129.8	142.5	155.3
(17) Bus & Pers Service	31.4	34.8	39.0	43.3	47.5	51.7
(20) Households	139.0	153.0	170.5	188.0	205.5	223.0

APPENDIX TABLE 15. PROJECTED FINAL DEMAND VECTORS FOR BASIC ECONOMIC SECTORS, WYOMING REGION 3, 1981, 1985, 1990, 1995, 2000, AND 2005, (1980 = BASE DOLLARS), MILLION DOLLARS

Sector	1981	1985	1990	1995	2000	2005
(1) Ag, Livestock	163.9	173.9	186.4	199.0	211.5	224.0
(2) Ag, Crops	52.4	54.3	56.6	59.0	61.3	63.7
(3) Metal Mining	23.5	23.5	23.5	23.5	23.5	23.5
(4) Coal Mining	138.2	165.1	198.8	232.4	266.1	299.7
(5) Pet/NG Exp/Ext	123.7	131.0	140.1	149.2	158.4	167.5
(6) Nonmetallic Mining	7.6	8.8	10.3	11.8	13.3	14.8
(7) Construction	27.5	27.5	27.4	27.3	27.2	27.1
(8) Lumber & Assoc Prod	8.6	9.8	11.3	12.8	14.3	15.8
(9) Ag Proc & Misc Mfg	73.7	78.6	84.7	90.8	96.9	103.0
(10) Pet Refining	466.2	521.3	590.1	658.9	727.7	796.5
(11) Metal Processing	2.8	2.7	2.5	2.3	2.1	1.9
(14) Electric Generation	33.4	33.4	33.4	33.4	33.4	33.4
(15) Retail	134.5	149.0	167.2	185.3	203.4	221.5
(17) Bus & Pers Service	44.9	49.7	55.8	61.9	67.9	74.0
(20) Households	433.8	477.2	531.6	585.9	640.2	694.5

APPENDIX TABLE 16. PROJECTED FINAL DEMAND VECTORS FOR BASIC ECONOMIC SECTORS, WYOMING REGION 4, 1981, 1985, 1990, 1995, 2000, AND 2005, (1980 = BASE DOLLARS), MILLION DOLLARS

Sector	1981	1985	1990	1995	2000	2005
(1) Ag, Livestock	74.6	79.4	85.4	91.4	97.4	103.4
(2) Ag, Crops	6.2	6.7	7.3	7.9	8.5	9.2
(3) Metal Mining	--	--	--	--	--	--
(4) Coal Mining	120.6	138.9	161.8	184.6	207.5	230.4
(5) Pet/NG Exp/Ext	620.5	680.0	754.4	828.8	903.2	977.6
(6) Nonmetallic Mining	129.8	153.8	183.7	213.6	243.5	273.4
(7) Construction	8.9	8.2	7.2	6.3	5.4	4.4
(8) Lumber & Assoc Prod	13.9	15.8	18.3	20.7	23.1	25.6
(9) Ag Proc & Misc Mfg	27.4	31.2	36.0	40.7	45.5	50.3
(10) Pet Refining	7.2	8.4	9.8	11.2	12.6	14.0
(11) Metal Processing	--	--	--	--	--	--
(14) Electric Generation	208.4	249.8	301.6	353.5	405.3	457.1
(15) Retail	109.2	121.0	135.7	150.4	165.1	179.9
(17) Bus & Pers Service	36.4	40.3	45.2	50.1	55.0	59.9
(20) Households	106.8	117.4	130.6	143.9	157.1	170.3

APPENDIX TABLE 17. PROJECTED FINAL DEMAND VECTORS FOR BASIC ECONOMIC SECTORS, WYOMING REGION 5, 1981, 1985, 1990, 1995, 2000, AND 2005, (1980 = BASE DOLLARS), MILLION DOLLARS

Sector	1981	1985	1990	1995	2000	2005
(1) Ag, Livestock	42.6	44.8	47.5	50.2	53.0	55.7
(2) Ag, Crops	6.2	5.6	5.0	4.4	3.8	3.2
(3) Metal Mining	19.9	19.9	19.9	19.9	19.9	19.9
(4) Coal Mining	--	--	--	--	--	--
(5) Pet/NG Exp/Ext	148.9	158.2	170.0	181.7	193.4	205.1
(6) Nonmetallic Mining	6.1	6.1	6.2	6.3	6.4	6.5
(7) Construction	11.5	11.3	10.9	10.6	10.2	9.9
(8) Lumber & Assoc Prod	9.1	10.2	11.5	12.8	14.1	15.5
(9) Ag Proc & Misc Mfg	18.6	20.9	23.6	26.4	29.2	31.9
(10) Pet Refining	--	--	--	--	--	--
(11) Metal Processing	17.5	19.1	21.1	23.1	25.1	27.1
(14) Electric Generation	--	--	--	--	--	--
(15) Retail	95.9	106.2	119.1	132.0	144.9	157.8
(17) Bus & Pers Service	32.0	35.4	39.7	44.0	48.3	52.6
(20) Households	69.4	74.1	80.0	85.8	91.7	97.5

APPENDIX TABLE 18. PROJECTED FINAL DEMAND VECTORS FOR BASIC ECONOMIC SECTORS, WYOMING REGION 6, 1981, 1985, 1990, 1995, 2000, AND 2005, (1980 = BASE DOLLARS), MILLION DOLLARS

Sector	1981	1985	1990	1995	2000	2005
(1) Ag, Livestock	89.6	95.9	103.8	111.7	119.5	127.4
(2) Ag, Crops	49.1	52.4	56.5	60.6	64.7	68.8
(3) Metal Mining	--	--	--	--	--	--
(4) Coal Mining	.2	.2	.2	.2	.2	.2
(5) Pet/NG Exp/Ext	494.8	502.6	512.3	522.0	531.7	541.4
(6) Nonmetallic Mining	7.1	8.1	9.3	10.5	11.7	13.0
(7) Construction	9.7	9.9	10.1	10.3	10.6	10.8
(8) Lumber & Assoc Prod	4.4	5.1	5.8	6.6	7.4	8.2
(9) Ag Proc & Misc Mfg	37.7	41.5	46.3	51.0	55.8	60.6
(10) Pet Refining	73.1	77.8	83.6	89.4	95.2	101.1
(11) Metal Processing	--	--	--	--	--	--
(14) Electric Generation	--	--	--	--	--	--
(15) Retail	50.1	55.5	62.2	68.9	75.6	82.4
(17) Bus & Pers Service	16.7	18.5	20.7	23.0	25.2	27.5
(20) Households	91.3	101.5	113.5	125.5	137.5	149.5

APPENDIX TABLE 19. PROJECTED FINAL DEMAND VECTORS FOR BASIC ECONOMIC SECTORS, WYOMING, 1981, 1985, 1990, 1995, 2000, AND 2005, (1980 = BASE DOLLARS), MILLION DOLLARS

Sector	1981	1985	1990	1995	2000	2005
(1) Ag, Livestock	602.5	640.8	688.6	736.5	784.3	832.2
(2) Ag, Crops	127.5	133.2	140.4	147.5	154.7	161.8
(3) Metal Mining	86.9	98.8	113.6	128.4	143.1	157.9
(4) Coal Mining	473.4	479.8	487.9	495.9	504.0	512.0
(5) Pet/NG Exp/Ext	1,746.4	1,890.8	2,071.4	2,252.0	2,432.6	2,613.2
(6) Nonmetallic Mining	160.2	185.5	217.3	249.0	280.8	312.5
(7) Construction	92.0	91.4	90.8	90.1	89.4	88.7
(8) Lumber & Assoc Prod	51.4	57.7	65.7	73.7	81.6	89.6
(9) Ag Proc & Misc Mfg	274.4	300.0	331.7	363.5	395.3	427.1
(10) Pet Refining	1,211.3	1,351.5	1,526.8	1,702.0	1,877.3	2,052.5
(11) Metal Processing	19.8	21.1	22.8	24.5	26.2	27.9
(14) Electric Generation	310.9	365.6	434.1	502.5	570.9	639.3
(15) Retail	521.1	577.2	647.3	717.5	787.7	857.8
(17) Bus & Pers Service	173.7	192.5	215.9	239.3	262.7	286.1
(20) Households	952.1	1,045.9	1,163.2	1,280.5	1,397.8	1,515.0

APPENDIX TABLE 20. GROSS BUSINESS VOLUMES OF ECONOMIC SECTORS ESTIMATED BY THE INPUT-OUTPUT MODEL, WYOMING REGION 2, 1960-1980, (1980 = BASE DOLLARS), MILLION DOLLARS

Year	Sector (1) Ag, Lvstk	(2) Ag, Crops	(3) Metal Mining	(4) Coal Mining	(5) Pet/NG Exp/Ext	(6) Nonmetallic Mining	(7) Constr	(8) Lumber	(9) Ag Proc & Misc Mfg	(10) Pet Refining	(11) Metal Proc
1960	80.8	61.6	4.3	3.7	204.1	3.1	47.4	0.8	128.3	118.5	--
1961	76.5	60.3	1.7	5.3	191.3	2.6	45.6	0.7	127.6	118.7	--
1962	79.1	61.9	2.4	5.2	216.4	2.9	49.5	0.7	129.2	152.0	--
1963	79.7	61.0	2.9	5.8	215.7	3.1	56.7	0.7	125.9	145.2	--
1964	75.8	57.8	1.2	7.1	222.4	2.8	54.3	0.7	120.5	142.2	--
1965	81.4	58.3	4.1	7.5	232.8	3.7	58.9	0.7	118.8	143.8	--
1966	91.8	61.5	0.9	8.8	225.8	3.0	55.4	0.7	121.9	139.3	--
1967	83.6	57.3	0.2	8.3	205.6	2.8	52.4	0.7	113.5	112.3	--
1968	91.4	59.4	0.7	6.5	200.0	2.6	44.7	0.9	116.7	113.8	--
1969	95.5	61.9	0.7	7.1	213.9	3.1	53.4	0.9	121.2	137.5	--
1970	93.7	63.3	1.6	7.8	206.4	3.2	54.8	0.8	125.1	139.2	--
1971	98.9	66.2	1.4	5.9	210.6	3.3	56.8	1.2	131.8	144.6	--
1972	113.6	73.0	5.6	10.2	204.1	3.5	56.1	1.4	142.0	148.4	--
1973	135.1	84.3	11.7	13.6	262.2	4.0	62.0	1.6	157.8	168.0	0.1
1974	103.9	75.3	10.1	12.6	473.9	4.4	75.4	1.3	151.7	321.6	0.1
1975	108.6	81.3	4.8	15.1	532.8	5.3	96.4	0.9	167.5	372.9	--
1976	110.5	88.3	4.0	16.9	496.9	5.1	88.9	1.4	182.7	376.8	--
1977	124.1	98.1	15.9	14.9	505.1	5.6	94.4	1.8	208.4	387.2	0.1
1978	139.3	102.4	17.1	18.6	509.8	6.0	101.4	1.9	213.4	386.0	0.1
1979	164.5	110.3	21.6	19.9	640.5	6.8	113.3	2.0	224.4	504.4	0.2
1980	141.3	101.0	25.4	18.8	936.3	8.1	154.3	2.3	209.2	733.7	0.2

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APPENDIX TABLE 20. GROSS BUSINESS VOLUMES OF ECONOMIC SECTORS ESTIMATED BY THE INPUT-OUTPUT MODEL, WYOMING REGION 2, 1960-1980, (1980 = BASE DOLLARS), MILLION DOLLARS (CONTINUED)

	Sector									
Year	(12) Trans	(13) Comm & Pub Util	(14) Elec Gen	(15) Retail Trade	(16) FIRE	(17) Bus & Pers Service	(18) Prof & Soc Serv	(19) Govt	(20) Households	TOTAL
1960	6.9	30.9	16.9	219.9	40.1	27.8	19.9	26.4	300.7	1,342.1
1961	6.5	29.9	23.3	218.3	39.3	28.8	19.3	25.6	290.7	1,312.0
1962	7.2	32.0	23.1	231.2	41.4	30.6	20.4	27.2	307.8	1,420.2
1963	7.6	36.4	24.6	264.7	48.2	34.0	24.4	31.6	370.4	1,538.6
1964	7.3	34.3	33.4	251.4	44.8	33.9	22.2	29.3	336.1	1,477.5
1965	7.8	34.9	33.4	256.1	44.9	35.4	22.1	29.4	333.5	1,507.5
1966	7.6	35.6	38.0	267.4	46.5	37.4	22.8	30.3	343.6	1,538.3
1967	7.1	34.7	37.1	267.9	45.5	39.9	22.5	29.6	338.5	1,459.5
1968	7.1	35.0	27.2	276.3	45.7	41.1	22.7	29.9	343.0	1,464.7
1969	7.7	37.4	32.1	295.6	48.8	44.2	24.2	31.9	364.3	1,581.4
1970	7.8	37.7	37.2	304.6	49.4	46.8	24.3	32.2	365.1	1,601.0
1971	7.9	37.9	25.1	306.1	49.0	46.9	24.2	32.3	365.0	1,615.1
1972	8.4	40.3	45.3	325.3	53.6	49.4	26.1	34.9	391.0	1,732.2
1973	10.3	48.4	65.3	371.3	65.1	52.6	31.8	42.2	477.4	2,064.8
1974	13.5	53.5	51.4	366.8	64.3	50.8	31.9	42.9	479.6	2,385.0
1975	14.8	59.9	47.7	400.9	71.9	52.8	36.1	48.1	544.6	2,662.4
1976	14.3	59.5	49.5	405.8	72.8	53.8	36.4	48.5	549.6	2,661.7
1977	15.6	63.1	64.7	428.5	78.7	55.7	39.0	52.2	586.8	2,839.9
1978	16.0	65.8	58.5	447.9	82.2	57.6	40.9	54.5	616.2	2,935.6
1979	19.4	76.9	57.2	507.5	94.0	63.7	47.4	63.1	714.4	3,451.5
1980	24.9	88.8	50.2	541.4	100.1	66.9	50.9	68.7	768.1	4,090.6

APPENDIX TABLE 21. GROSS BUSINESS VOLUMES OF ECONOMIC SECTORS ESTIMATED BY THE INPUT-OUTPUT MODEL, WYOMING REGION 3, 1960-1980, (1980 = BASE DOLLARS), MILLION DOLLARS

	Sector										
Year	(1) Ag, Lvstk	(2) Ag, Crops	(3) Metal Mining	(4) Coal Mining	(5) Pet/NG Exp/Ext	(6) Nonmetallic Mining	(7) Constr	(8) Lumber	(9) Ag Proc & Misc Mfg	(10) Pet Refining	(11) Metal Proc
1960	151.5	134.2	2.0	0.6	112.1	5.0	72.9	3.1	162.6	112.7	3.3
1961	146.0	132.1	10.9	1.4	109.9	4.9	71.2	3.4	159.1	111.7	4.4
1962	155.0	124.0	10.1	1.8	107.7	4.9	72.9	3.4	160.7	108.5	2.9
1963	152.1	127.6	7.1	2.1	106.9	5.9	93.8	3.3	160.2	105.7	3.1
1964	138.5	114.6	4.2	1.8	103.0	5.6	82.8	3.2	151.2	102.6	3.8
1965	143.4	104.9	7.1	1.6	98.1	5.3	88.3	3.2	150.5	97.1	3.4
1966	165.5	124.4	1.5	1.7	94.7	5.2	81.6	4.1	160.7	94.0	3.5
1967	161.2	128.2	3.6	1.6	93.6	5.2	82.1	3.5	167.9	92.5	3.3
1968	170.6	127.1	4.4	1.6	93.4	6.2	84.0	4.6	159.0	91.5	3.2
1969	175.6	127.3	6.2	1.9	88.2	6.6	89.1	5.3	162.4	87.3	3.9
1970	169.0	128.5	11.4	5.3	102.8	7.7	85.8	4.5	160.4	106.8	4.2
1971	179.1	126.0	18.5	6.1	102.4	8.4	81.4	6.1	163.3	108.2	3.8
1972	217.9	166.0	22.8	12.3	101.3	9.2	85.5	8.4	194.0	108.1	3.8
1973	251.7	205.5	16.7	25.7	110.5	10.9	113.7	9.9	223.9	117.5	3.0
1974	178.0	184.6	8.0	42.1	212.9	10.2	97.9	6.1	196.9	238.1	2.9
1975	182.0	170.4	11.7	80.0	258.9	12.1	152.5	4.7	201.5	294.4	3.1
1976	191.3	154.5	23.6	84.0	275.7	10.8	102.7	8.1	207.3	309.9	3.3
1977	219.2	155.5	32.9	107.0	284.5	12.0	114.9	8.8	220.7	318.1	2.8
1978	246.8	172.3	46.4	129.9	283.5	13.0	123.4	10.0	248.1	311.9	3.3
1979	297.3	201.1	36.2	128.8	383.8	16.5	166.4	9.2	278.4	399.9	3.2
1980	250.5	192.3	35.5	121.3	636.6	17.6	164.4	9.2	260.2	611.0	1.8

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APPENDIX TABLE 21. GROSS BUSINESS VOLUMES OF ECONOMIC SECTORS ESTIMATED BY THE INPUT-OUTPUT MODEL, WYOMING REGION 3, 1960-1980, (1980 = BASE DOLLARS), MILLION DOLLARS (CONTINUED)

	Sector									
Year	(12) Trans	(13) Comm & Pub Util	(14) Elec Gen	(15) Retail Trade	(16) FIRE	(17) Bus & Pers Service	(18) Prof & Soc Serv	(19) Govt	(20) Households	TOTAL
1960	8.3	52.6	--	414.3	78.5	48.2	40.3	50.6	616.6	2,069.4
1961	8.7	51.7	--	410.2	76.5	49.4	39.1	49.5	597.4	2,037.5
1962	8.7	52.6	--	418.9	77.5	51.1	39.9	50.2	608.9	2,059.7
1963	9.8	66.8	--	524.2	100.0	60.8	53.0	64.6	816.9	2,463.9
1964	8.7	57.3	--	459.6	84.5	56.9	44.3	54.7	680.5	2,157.8
1965	8.5	54.1	--	440.6	78.9	56.8	41.1	51.3	629.8	2,064.0
1966	8.6	57.0	--	471.6	84.1	61.4	43.5	54.4	665.6	2,183.1
1967	9.0	59.7	--	497.0	88.2	65.3	45.7	57.0	700.4	2,265.0
1968	9.1	59.3	--	499.8	87.0	67.5	45.0	56.4	686.5	2,256.2
1969	9.3	60.3	--	514.0	88.1	71.2	45.5	57.1	693.1	2,292.4
1970	10.1	62.7	--	534.5	90.4	75.2	46.7	58.8	712.2	2,377.0
1971	10.6	64.0	--	541.7	92.1	76.3	47.8	60.1	727.4	2,423.3
1972	12.1	74.0	--	620.5	108.4	84.0	56.0	70.4	851.0	2,805.7
1973	14.6	102.3	--	822.5	153.7	100.1	81.4	99.1	1,248.5	3,711.2
1974	13.8	84.7	--	672.8	121.4	85.3	63.4	78.9	967.2	3,265.2
1975	15.4	89.5	--	687.5	124.6	85.2	65.3	81.5	993.5	3,513.8
1976	16.2	90.3	--	685.6	124.5	86.3	66.1	82.0	1,004.1	3,526.3
1977	17.7	98.0	--	732.9	134.9	90.0	72.1	89.0	1,093.7	3,804.7
1978	19.4	105.5	--	785.7	145.8	95.1	77.8	96.1	1,178.2	4,092.2
1979	22.1	120.0	--	881.1	164.7	104.3	87.4	108.6	1,324.2	4,733.2
1980	26.1	126.8	33.4	888.2	166.8	106.0	88.0	110.7	1,332.3	5,178.7

APPENDIX TABLE 22. GROSS BUSINESS VOLUMES OF ECONOMIC SECTORS ESTIMATED BY THE INPUT-OUTPUT MODEL, WYOMING REGION 4, 1960-1980, (1980 = BASE DOLLARS), MILLION DOLLARS

	Sector										
Year	(1) Ag, Lvstk	(2) Ag, Crops	(3) Metal Mining	(4) Coal Mining	(5) Pet/NG Exp/Ext	(6) Nonmetallic Mining	(7) Constr	(8) Lumber	(9) Ag Proc & Misc Mfg	(10) Pet Refining	(11) Metal Proc
1960	70.8	32.6	--	1.9	89.3	8.0	31.6	6.9	48.7	--	--
1961	64.7	31.4	--	2.0	120.3	6.9	34.2	6.9	47.7	--	--
1962	69.0	33.6	--	1.8	107.1	8.6	34.1	7.0	51.6	--	--
1963	66.5	31.5	--	4.8	106.8	9.6	41.0	6.9	50.0	0.2	--
1964	66.1	31.7	--	4.1	110.9	11.0	39.1	6.9	47.6	0.2	--
1965	73.9	34.8	--	4.2	103.8	12.5	42.4	7.0	49.7	0.2	--
1966	82.0	38.0	--	4.7	98.5	14.3	38.9	7.5	54.3	0.2	--
1967	77.2	35.5	--	4.6	95.4	14.7	38.2	7.8	52.4	0.2	--
1968	84.0	38.4	--	6.4	94.2	18.9	46.5	9.7	58.1	0.3	--
1969	88.8	40.8	--	8.7	102.9	25.5	40.1	11.0	63.2	0.4	--
1970	84.3	40.2	--	10.8	99.5	32.9	37.1	9.2	62.1	0.4	--
1971	88.3	41.7	--	12.6	98.4	31.9	34.8	12.1	65.6	0.8	--
1972	102.8	47.6	--	14.7	92.1	36.1	50.9	12.6	73.0	1.2	--
1973	118.3	59.5	--	23.8	104.6	44.4	45.9	15.8	87.7	1.0	--
1974	91.1	51.4	--	36.3	136.4	58.3	47.4	9.8	86.4	2.4	--
1975	95.8	52.6	--	47.6	167.8	70.0	53.4	9.2	86.9	4.2	--
1976	99.1	57.9	--	79.0	233.0	91.3	65.5	12.1	96.0	18.5	--
1977	110.8	61.8	--	106.4	260.7	108.5	74.3	16.9	107.4	6.7	--
1978	124.4	66.3	--	107.7	312.2	102.6	85.0	15.8	114.6	8.0	--
1979	143.1	76.4	--	140.4	453.2	128.6	96.0	14.7	131.9	12.0	--
1980	127.5	74.2	--	175.6	692.5	150.9	123.0	8.7	131.4	11.3	--

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APPENDIX TABLE 22. GROSS BUSINESS VOLUMES OF ECONOMIC SECTORS ESTIMATED BY THE INPUT-OUTPUT MODEL, WYOMING REGION 4, 1960-1980, (1980 = BASE DOLLARS), MILLION DOLLARS (CONTINUED)

	Sector									
Year	(12) Trans	(13) Comm & Pub Util	(14) Elec Gen	(15) Retail Trade	(16) FIRE	(17) Bus & Pers Service	(18) Prof & Soc Serv	(19) Govt	(20) Households	TOTAL
1960	3.9	20.9	--	168.3	26.9	25.9	13.8	17.7	206.3	773.5
1961	4.3	21.8	--	173.2	27.0	27.4	13.9	17.9	207.2	806.8
1962	4.3	22.4	--	181.9	28.0	29.3	14.4	18.5	214.4	826.0
1963	4.7	26.2	17.6	210.6	34.5	32.5	17.7	22.4	266.0	949.5
1964	4.7	25.0	11.9	203.9	31.8	33.0	16.2	20.8	242.3	907.2
1965	4.7	25.3	11.9	211.4	32.2	34.9	16.3	21.1	242.1	928.4
1966	4.9	26.5	13.6	224.0	33.9	37.5	17.1	22.2	253.7	971.8
1967	4.9	26.9	13.2	231.5	34.3	39.6	17.3	22.5	257.7	973.8
1968	5.3	29.4	23.5	251.3	37.6	43.1	18.8	24.5	278.0	1,068.0
1969	5.8	32.1	27.7	270.6	40.6	46.7	20.3	26.5	299.2	1,150.9
1970	6.0	33.4	32.2	283.5	41.7	49.6	20.7	27.2	306.5	1,177.3
1971	6.1	34.0	39.6	287.8	43.0	50.4	21.3	27.9	313.5	1,209.8
1972	6.5	36.5	43.6	307.3	46.6	52.9	22.9	30.2	336.1	1,313.6
1973	7.4	42.7	62.9	343.0	55.8	55.8	27.4	35.8	402.6	1,534.4
1974	7.8	42.8	83.8	323.8	53.7	52.0	25.8	34.3	378.4	1,521.9
1975	8.9	48.4	109.4	348.5	60.7	53.3	29.1	38.6	427.5	1,711.9
1976	11.1	58.8	146.8	396.5	72.4	57.8	34.6	45.8	505.9	2,082.1
1977	12.7	68.4	191.7	445.8	85.3	62.5	40.9	53.6	594.6	2,409.0
1978	13.6	71.8	173.4	468.1	88.6	64.5	43.0	56.2	629.1	2,544.9
1979	17.1	85.9	207.5	533.2	102.7	71.0	49.7	65.4	725.6	3,054.4
1980	21.6	101.7	182.0	594.3	113.3	75.9	56.3	73.6	827.8	3,541.6

APPENDIX TABLE 23. GROSS BUSINESS VOLUMES OF ECONOMIC SECTORS ESTIMATED BY THE INPUT-OUTPUT MODEL, WYOMING REGION 5, 1960-1980, (1980 = BASE DOLLARS), MILLION DOLLARS

	Sector										
Year	(1) Ag, Lvstk	(2) Ag, Crops	(3) Metal Mining	(4) Coal Mining	(5) Pet/NG Exp/Ext	(6) Nonmetallic Mining	(7) Constr	(8) Lumber	(9) Ag Proc & Misc Mfg	(10) Pet Refining	(11) Metal Proc
1960	44.8	27.9	18.7	--	72.3	1.4	23.7	6.3	34.1	--	11.3
1961	24.5	21.4	18.6	--	70.4	1.2	22.1	6.2	24.6	--	11.2
1962	46.7	27.4	18.5	--	65.3	1.4	23.4	6.3	34.9	--	11.2
1963	46.1	28.6	21.1	--	61.5	1.7	28.0	6.4	35.3	--	12.7
1964	43.9	28.4	18.9	--	61.6	1.5	26.0	6.3	34.4	--	11.5
1965	48.6	28.8	15.8	--	61.8	1.6	27.8	6.4	36.4	--	9.6
1966	54.3	31.2	17.9	--	59.0	1.6	26.1	6.9	40.2	--	10.8
1967	52.6	30.6	18.4	--	62.8	1.6	26.8	7.9	40.0	--	11.1
1968	57.5	32.8	19.8	--	59.2	1.7	30.0	9.0	44.0	--	12.0
1969	57.4	34.4	19.9	--	55.3	1.9	26.9	11.7	45.4	--	12.0
1970	55.0	32.0	26.1	--	55.1	1.9	27.8	8.5	45.6	--	10.9
1971	56.9	33.0	19.2	--	55.5	1.9	28.6	8.0	45.9	--	10.6
1972	65.9	34.9	25.4	--	53.7	1.8	22.3	9.3	50.1	--	12.6
1973	74.7	39.1	18.2	--	53.3	2.0	24.1	11.2	54.8	--	13.7
1974	52.1	30.2	16.0	--	63.1	1.9	26.8	7.0	44.2	--	16.3
1975	54.4	32.3	16.9	--	56.7	1.9	25.6	6.7	46.8	--	18.5
1976	56.8	34.6	36.2	--	66.9	2.2	30.9	9.3	49.9	--	19.7
1977	66.2	38.1	46.5	0.1	100.0	2.3	34.1	12.8	59.3	--	20.5
1978	68.3	39.9	34.6	--	95.0	2.2	33.1	11.7	63.3	--	17.8
1979	77.7	43.3	26.3	0.1	136.6	2.8	49.6	10.7	69.2	--	16.0
1980	68.4	41.4	30.1	0.1	162.0	20.8	48.3	6.8	64.8	--	17.6

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APPENDIX TABLE 23. GROSS BUSINESS VOLUMES OF ECONOMIC SECTORS ESTIMATED BY THE INPUT-OUTPUT MODEL, WYOMING REGION 5, 1960-1980, (1980 = BASE DOLLARS), MILLION DOLLARS (CONTINUED)

	Sector									
Year	(12) Trans	(13) Comm & Pub Util	(14) Elec Gen	(15) Retail Trade	(16) FIRE	(17) Bus & Pers Service	(18) Prof & Soc Serv	(19) Govt	(20) Households	TOTAL
1960	4.4	18.3	--	146.1	23.7	22.8	12.3	15.9	182.7	666.7
1961	4.2	16.6	--	136.7	20.8	22.9	10.9	14.1	161.8	588.2
1962	4.4	18.5	--	154.1	23.8	25.3	12.4	16.0	183.3	672.9
1963	4.9	22.0	--	181.6	29.3	28.5	15.5	19.6	232.5	775.3
1964	4.6	20.2	--	172.4	26.4	28.7	13.8	17.7	205.4	721.7
1965	4.4	20.0	--	174.6	25.8	29.7	13.3	17.3	198.3	720.2
1966	4.7	20.9	--	185.4	27.2	32.1	14.0	18.2	208.4	758.9
1967	4.9	21.9	--	195.8	28.4	34.3	14.7	19.0	218.3	789.1
1968	5.3	25.6	--	226.4	34.0	38.4	17.9	22.7	267.6	903.9
1969	5.4	26.1	--	235.6	34.7	41.1	18.3	23.1	271.6	920.8
1970	5.6	25.4	--	235.7	33.1	42.7	17.2	22.2	256.2	901.0
1971	5.2	24.2	--	229.1	31.4	42.1	16.2	21.0	240.3	869.1
1972	5.7	25.1	--	236.0	32.4	43.7	16.7	21.8	246.4	903.8
1973	5.5	26.4	--	244.5	34.9	44.2	18.1	23.4	267.6	955.7
1974	5.1	24.2	--	223.8	31.1	40.5	16.2	20.9	241.0	860.4
1975	5.1	23.4	--	217.7	30.2	39.4	15.6	20.4	231.5	843.1
1976	6.7	26.7	--	235.9	34.3	41.7	17.7	23.2	262.5	955.1
1977	8.2	31.4	--	261.5	40.1	44.1	21.0	27.2	311.2	1,124.6
1978	7.2	28.9	--	249.8	36.8	43.6	19.0	24.9	280.2	1,056.3
1979	7.6	31.7	--	268.6	39.5	46.2	20.3	26.6	299.9	1,172.7
1980	8.6	35.5	--	283.6	42.1	47.7	21.6	28.7	322.6	1,250.7

APPENDIX TABLE 24. GROSS BUSINESS VOLUMES OF ECONOMIC SECTORS ESTIMATED BY THE INPUT-OUTPUT MODEL, WYOMING REGION 6, 1960-1980, (1980 = BASE DOLLARS), MILLION DOLLARS

	Sector										
Year	(1) Ag, Lvstk	(2) Ag, Crops	(3) Metal Mining	(4) Coal Mining	(5) Pet/NG Exp/Ext	(6) Nonmetallic Mining	(7) Constr	(8) Lumber	(9) Ag Proc & Misc Mfg	(10) Pet Refining	(11) Metal Proc
1960	73.6	70.8	--	0.1	328.2	3.2	53.0	1.5	69.7	28.5	--
1961	70.0	69.5	--	0.1	335.6	3.3	53.3	1.5	68.6	32.2	--
1962	72.0	61.7	--	0.1	326.1	3.6	52.4	1.5	68.7	31.3	--
1963	72.4	74.1	--	0.1	315.1	3.9	56.9	1.5	71.4	29.4	--
1964	69.2	72.5	--	0.1	306.9	3.9	53.9	1.5	70.3	31.1	--
1965	79.3	71.2	--	0.1	287.7	4.3	54.0	1.3	75.0	31.6	--
1966	91.4	81.6	--	0.1	275.2	4.5	51.9	2.3	81.8	30.6	--
1967	82.5	78.3	--	0.1	276.1	4.0	51.5	1.6	77.6	34.3	--
1968	88.5	88.6	--	0.1	268.0	4.6	52.2	2.3	83.3	22.9	--
1969	88.2	84.4	--	0.1	259.3	4.8	46.8	3.0	83.4	22.1	--
1970	81.5	78.7	--	0.1	235.4	5.0	45.9	2.7	79.7	22.4	--
1971	84.7	88.9	--	0.1	232.3	4.7	48.2	2.9	82.2	22.5	--
1972	98.5	88.7	--	0.1	211.5	4.7	45.0	3.8	90.0	22.2	--
1973	113.7	119.3	--	0.1	225.5	5.4	50.2	5.7	103.1	24.1	--
1974	89.9	133.3	--	0.1	343.1	6.8	61.8	3.2	96.8	43.7	--
1975	87.9	101.8	--	0.1	372.3	7.2	70.7	2.0	97.1	43.4	--
1976	94.6	98.8	--	0.1	374.0	7.9	63.6	3.7	104.3	45.9	--
1977	107.9	96.4	--	0.1	369.8	8.9	66.2	4.0	112.0	52.0	--
1978	125.7	112.4	--	0.1	371.2	9.9	73.7	4.6	125.5	50.4	--
1979	146.5	118.4	--	0.2	406.7	12.0	72.5	4.1	137.1	64.2	--
1980	129.6	118.7	--	0.4	750.5	11.9	115.2	3.8	129.7	97.8	--

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APPENDIX TABLE 24. GROSS BUSINESS VOLUMES OF ECONOMIC SECTORS ESTIMATED BY THE INPUT-OUTPUT MODEL, WYOMING REGION 6, 1960-1980, (1980 = BASE DOLLARS), MILLION DOLLARS (CONTINUED)

	Sector									
Year	(12) Trans	(13) Comm & Pub Util	(14) Elec Gen	(15) Retail Trade	(16) FIRE	(17) Bus & Pers Service	(18) Prof & Soc Serv	(19) Govt	(20) Households	TOTAL
1960	7.6	31.1	--	194.2	37.2	21.0	18.6	24.5	281.3	1,244.1
1961	7.7	31.1	--	193.7	36.7	21.5	18.3	24.3	277.0	1,244.4
1962	7.6	30.6	--	191.2	35.8	21.7	18.0	23.8	272.7	1,218.8
1963	7.8	34.0	--	221.4	42.1	24.7	21.3	27.6	324.1	1,327.8
1964	7.5	31.9	--	208.9	38.9	24.1	19.5	25.6	295.5	1,261.3
1965	7.3	31.1	--	207.5	38.1	24.6	18.9	25.1	286.9	1,244.0
1966	7.3	32.3	--	221.2	40.5	26.5	20.0	26.5	302.3	1,296.0
1967	7.3	32.2	--	222.2	40.1	27.2	19.9	26.3	301.6	1,282.8
1968	7.4	33.5	--	236.6	42.6	29.3	21.0	27.8	317.5	1,326.2
1969	7.2	32.6	--	233.5	41.3	29.9	20.4	27.0	307.3	1,291.3
1970	6.8	31.5	--	231.3	40.1	30.6	19.9	26.2	300.0	1,237.8
1971	6.9	32.7	--	242.5	42.4	31.7	20.9	27.6	315.4	1,286.6
1972	6.7	32.8	--	246.9	43.1	32.6	21.3	28.0	320.9	1,296.8
1973	7.6	37.8	--	285.1	51.5	35.8	25.2	33.2	379.5	1,502.8
1974	9.3	41.5	--	292.7	53.3	35.3	25.8	34.5	389.0	1,660.1
1975	9.6	42.0	--	284.0	51.9	34.0	25.8	34.0	391.6	1,655.4
1976	9.7	42.2	--	284.1	51.9	34.4	25.9	34.1	392.1	1,667.3
1977	9.8	43.5	--	292.4	53.8	35.2	27.0	35.4	409.0	1,723.4
1978	10.3	46.5	--	316.9	58.8	37.4	29.3	38.5	443.1	1,854.1
1979	11.2	50.1	--	338.4	62.9	39.7	31.4	41.4	473.9	2,010.7
1980	16.9	65.8	--	395.5	74.6	44.5	37.8	49.8	572.9	2,615.2

APPENDIX TABLE 25. GROSS BUSINESS VOLUMES OF ECONOMIC SECTORS ESTIMATED BY THE INPUT-OUTPUT MODEL, WYOMING, 1960-1980, (1980 = BASE DOLLARS), MILLION DOLLARS

	Sector										
Year	(1) Ag, Lvstk	(2) Ag, Crops	(3) Metal Mining	(4) Coal Mining	(5) Pet/NG Exp/Ext	(6) Nonmetallic Mining	(7) Constr	(8) Lumber	(9) Ag Proc & Misc Mfg	(10) Pet Refining	(11) Metal Proc
1960	533.9	381.7	25.0	9.8	930.5	27.5	271.8	23.6	521.0	273.7	14.6
1961	482.7	362.8	31.2	11.8	957.1	25.3	268.4	23.6	499.2	276.5	15.6
1962	523.8	363.1	30.9	11.9	942.9	27.7	274.9	23.8	517.7	305.9	14.2
1963	518.6	378.6	31.2	16.0	928.6	30.9	328.7	23.7	515.9	294.2	16.0
1964	493.2	357.2	24.5	16.2	944.7	32.1	306.5	23.5	495.8	293.4	15.2
1965	538.7	352.9	27.0	16.1	929.3	35.2	328.4	23.6	507.8	290.1	13.0
1966	611.7	397.2	20.3	17.8	889.8	35.8	305.1	27.8	544.1	280.6	14.4
1967	568.5	387.7	22.3	17.1	859.6	42.7	299.9	26.9	530.1	255.5	14.4
1968	618.1	405.0	24.9	17.0	871.8	40.1	312.5	33.7	546.2	244.4	15.1
1969	633.6	408.2	26.9	20.6	945.2	48.8	318.3	39.8	562.9	260.9	16.0
1970	604.6	399.5	39.1	30.8	954.2	57.3	310.9	32.1	555.6	281.8	15.0
1971	633.5	414.1	38.9	32.2	937.7	56.0	303.5	39.2	574.9	289.7	14.4
1972	753.1	480.3	53.7	41.9	881.9	62.3	326.7	48.2	649.5	293.9	16.6
1973	876.2	597.6	46.6	67.5	1,026.6	76.2	363.4	59.0	745.5	326.7	16.7
1974	644.1	540.9	34.1	104.4	1,683.0	92.4	392.9	36.9	668.9	645.3	19.1
1975	657.5	507.2	33.3	158.1	1,780.7	105.7	495.7	30.6	698.7	757.9	21.8
1976	699.2	511.9	63.6	216.2	1,845.7	127.3	428.0	46.8	752.6	796.3	23.1
1977	801.0	536.0	95.2	321.4	1,989.7	148.6	474.2	57.0	837.4	829.3	23.4
1978	897.6	587.5	98.0	404.6	2,036.7	147.0	508.9	57.5	911.5	820.7	21.3
1979	1,059.6	657.7	85.6	515.3	2,491.0	183.5	603.4	54.0	1,013.4	1,062.7	19.4
1980	911.8	625.1	91.8	627.5	3,830.6	224.5	747.1	44.5	958.1	1,572.6	19.7

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APPENDIX TABLE 25. GROSS BUSINESS VOLUMES OF ECONOMIC SECTORS ESTIMATED BY THE INPUT-OUTPUT MODEL, WYOMING, 1960-1980, (1980 = BASE DOLLARS), MILLION DOLLARS (CONTINUED)

	Sector									
Year	(12) Trans	(13) Comm & Pub Util	(14) Elec Gen	(15) Retail Trade	(16) FIRE	(17) Bus & Pers Service	(18) Prof & Soc Serv	(19) Govt	(20) Households	TOTAL
1960	35.9	178.3	24.4	1,311.2	240.0	163.8	121.8	157.0	1,840.4	7,085.6
1961	36.0	174.3	28.5	1,291.3	231.5	167.3	117.3	151.7	1,770.3	6,922.4
1962	36.7	179.7	28.2	1,343.4	239.0	176.4	121.3	156.8	1,830.7	7,149.0
1963	39.7	213.1	47.6	1,596.2	292.4	201.5	151.5	190.6	2,306.5	8,121.5
1964	37.9	195.0	49.0	1,478.2	261.7	197.2	134.0	171.0	2,029.8	7,556.1
1965	38.1	192.3	49.1	1,477.6	255.9	202.9	130.0	167.6	1,963.3	7,538.9
1966	38.5	200.1	55.8	1,566.7	270.1	217.4	136.5	176.4	2,058.0	7,864.1
1967	38.4	203.2	54.3	1,611.2	273.8	228.4	139.0	178.8	2,099.3	7,851.1
1968	40.1	212.5	53.7	1,701.8	286.9	244.5	145.8	187.4	2,197.3	8,198.8
1969	42.5	221.9	64.7	1,776.9	296.4	260.1	150.5	193.8	2,263.7	8,551.7
1970	43.6	225.1	75.2	1,821.0	297.8	272.7	150.9	195.2	2,272.2	8,634.6
1971	43.8	226.8	68.5	1,838.3	301.1	275.7	152.6	197.3	2,293.3	8,731.5
1972	46.8	244.3	93.1	1,984.9	330.9	292.7	166.7	215.9	2,497.3	9,480.7
1973	54.5	302.3	134.3	2,372.5	420.2	323.5	214.2	272.3	3,227.2	11,523.0
1974	60.7	292.9	140.0	2,159.5	377.5	295.6	190.8	247.4	2,871.5	11,497.9
1975	64.0	307.4	161.5	2,215.1	392.3	295.6	199.2	257.7	2,997.2	12,137.2
1976	68.7	324.8	201.0	2,303.9	413.0	307.1	210.6	271.6	3,155.8	12,767.2
1977	76.8	361.8	262.5	2,510.7	461.2	324.7	236.0	302.8	3,526.9	14,176.6
1978	80.3	383.5	263.1	2,666.2	491.6	339.8	251.9	322.5	3,761.1	15,051.3
1979	92.7	439.6	295.2	2,989.8	555.9	371.8	284.9	365.6	4,252.0	17,393.1
1980	116.7	506.3	292.3	3,215.4	598.7	391.7	309.8	399.0	4,629.9	20,113.1

APPENDIX TABLE 26. EMPLOYMENT BY ECONOMIC SECTOR, WYOMING REGION 2, 1960-1980

Year	Sector (1) & (2) Agric	(3) Metal Mining	(4) Coal Mining	(5) Pet/NG Exp/Ext	(6) Nonmetallic Mining	(7) Constr	(8) Lumber	(9) Ag Proc & Misc Mfg	(10) Pet Refining	(11) Metal Proc
1960	862	195	8	2,132	86	1,648	56	2,508	1,822	--
1961	859	205	9	2,236	91	1,738	61	2,629	1,912	--
1962	853	214	9	2,339	96	1,826	66	2,750	2,003	--
1963	850	208	19	2,490	79	1,804	65	2,737	1,501	--
1964	845	214	27	2,745	68	1,802	59	2,843	1,083	--
1965	858	583	46	2,527	67	1,613	72	2,416	1,074	--
1966	872	160	26	2,206	53	1,274	70	2,481	975	--
1967	884	210	13	2,042	51	1,102	63	2,278	805	--
1968	898	211	12	2,168	85	1,492	66	2,475	890	--
1969	911	209	10	2,264	167	1,848	69	2,620	956	--
1970	883	207	2	2,382	118	1,563	69	2,588	994	--
1971	855	259	22	2,423	69	2,002	67	3,098	832	--
1972	828	91	62	2,625	92	1,865	72	2,536	845	--
1973	800	105	27	2,601	113	1,980	59	2,608	815	--
1974	772	343	36	1,885	235	2,156	87	3,392	932	--
1975	792	593	107	2,311	151	2,434	107	4,519	434	--
1976	812	682	96	2,509	157	2,862	90	3,582	1,099	--
1977	830	1,326	9	3,024	650	3,108	94	4,084	821	--
1978	850	1,817	97	3,854	413	3,494	97	4,600	751	--
1979	870	1,633	221	3,666	396	4,710	188	5,728	880	--
1980	890	1,810	336	5,059	492	4,383	151	5,814	805	--

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APPENDIX TABLE 26. EMPLOYMENT BY ECONOMIC SECTOR, WYOMING REGION 2, 1960-1980 (CONTINUED)

	Sector									
Year	(12) Trans	(13) Comm & Pub Util	(14) Elec Gen	(15) Retail Trade	(16) FIRE	(17) Bus & Pers Service	(18) Prof & Soc Serv	(19) Govt	(20) Households	TOTAL
1960	989	1,117	625	3,784	998	1,548	1,032	4,261	--	23,671
1961	1,039	1,173	681	3,969	1,046	1,623	1,082	4,378	--	24,731
1962	1,088	1,230	735	4,151	1,095	1,696	1,131	4,507	--	25,789
1963	960	1,240	665	4,215	1,084	1,728	1,155	4,489	--	25,289
1964	861	1,291	556	4,409	1,121	1,831	1,220	4,442	--	25,417
1965	855	1,280	663	4,404	1,088	1,854	1,343	4,379	--	25,122
1966	922	1,272	649	4,575	1,128	1,742	1,312	4,435	--	24,152
1967	848	1,170	601	4,228	1,031	1,629	1,279	4,476	--	22,710
1968	960	1,123	533	4,391	1,146	1,732	1,363	4,716	--	24,261
1969	1,057	1,060	461	4,474	1,242	1,801	1,416	4,964	--	25,529
1970	955	1,122	459	4,652	1,163	1,869	1,466	4,858	--	25,350
1971	902	1,103	346	4,472	1,074	2,016	1,585	5,032	--	26,157
1972	869	1,019	539	4,144	1,029	1,540	1,309	4,621	--	24,086
1973	939	1,105	480	4,143	1,040	1,749	1,491	4,796	--	24,851
1974	687	688	257	5,221	1,057	2,167	1,921	4,900	--	26,736
1975	850	851	235	6,196	1,290	2,501	2,042	4,934	--	30,347
1976	1,174	1,436	345	6,273	1,610	2,519	2,148	5,242	--	32,636
1977	1,103	1,658	398	6,481	1,783	3,002	2,357	5,654	--	36,382
1978	1,253	1,471	334	7,815	1,851	3,206	2,622	5,847	--	40,372
1979	1,483	1,740	305	8,348	2,083	4,006	2,900	6,036	--	45,193
1980	1,243	1,583	326	8,127	2,217	3,840	3,270	6,350	--	46,696

APPENDIX TABLE 27. EMPLOYMENT BY ECONOMIC SECTOR, WYOMING REGION 3, 1960-1980

Year	Sector									
	(1) & (2) Agric	(3) Metal Mining	(4) Coal Mining	(5) Pet/NG Exp/Ext	(6) Nonmetallic Mining	(7) Constr	(8) Lumber	(9) Ag Proc & Misc Mfg	(10) Pet Refining	(11) Metal Proc
1960	2,566	262	28	225	142	2,441	535	3,392	1,193	170
1961	2,529	257	29	216	136	2,244	543	3,263	1,114	166
1962	2,492	251	29	209	129	2,053	550	3,144	1,035	161
1963	2,455	263	30	260	100	2,532	592	3,219	988	159
1964	2,418	295	29	286	72	2,683	638	3,071	837	171
1965	2,432	251	29	302	34	2,168	613	2,734	729	153
1966	2,448	335	43	280	45	1,771	297	3,003	830	155
1967	2,460	247	100	440	34	1,962	330	2,875	816	139
1968	2,476	397	91	402	186	1,638	437	2,865	621	137
1969	2,490	493	77	352	304	1,443	523	2,948	434	116
1970	2,438	469	138	355	384	1,499	606	2,917	431	120
1971	2,388	452	300	300	590	1,468	417	2,567	438	112
1972	2,336	365	184	284	612	1,568	420	2,522	584	112
1973	2,286	686	321	265	168	1,976	399	3,456	348	110
1974	2,234	776	632	479	230	2,009	468	3,378	321	126
1975	2,244	823	800	525	152	2,078	409	3,348	332	128
1976	2,256	903	753	529	179	2,541	472	3,605	330	125
1977	2,266	848	1,005	115	224	2,680	655	3,814	322	123
1978	2,275	1,353	1,036	288	212	3,336	804	4,083	343	124
1979	2,285	1,720	1,507	210	263	4,079	503	4,137	343	157
1980	2,297	1,749	1,525	425	307	3,457	545	4,328	368	142

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APPENDIX TABLE 27. EMPLOYMENT BY ECONOMIC SECTOR, WYOMING REGION 3, 1960-1980 (CONTINUED)

	Sector									
Year	(12) Trans	(13) Comm & Pub Util	(14) Elec Gen	(15) Retail Trade	(16) FIRE	(17) Bus & Pers Service	(18) Prof & Soc Serv	(19) Govt	(20) Households	TOTAL
1960	1,409	1,592	--	9,563	1,939	3,399	2,268	15,599	--	46,723
1961	1,305	1,475	--	8,985	1,749	3,107	2,074	16,227	--	45,419
1962	1,203	1,361	--	8,430	1,568	2,827	1,887	16,792	--	44,121
1963	1,147	1,489	--	9,038	1,647	2,993	1,997	17,232	--	46,141
1964	977	1,470	--	8,943	1,524	2,851	1,895	17,481	--	45,641
1965	850	1,280	--	8,351	1,415	2,889	2,092	17,608	--	43,930
1966	884	1,221	--	8,452	1,518	3,009	2,276	17,332	--	43,899
1967	929	1,290	--	8,396	1,632	2,969	2,335	16,217	--	43,171
1968	971	1,146	--	8,233	1,553	3,046	2,397	16,959	--	43,555
1969	1,049	1,053	--	8,277	1,573	3,242	2,546	16,439	--	43,359
1970	965	1,135	--	8,276	1,583	3,248	2,553	16,493	--	43,610
1971	915	1,116	--	8,074	1,597	3,330	2,617	17,668	--	44,349
1972	860	1,014	--	7,395	1,527	3,121	2,632	17,065	--	42,601
1973	954	1,119	--	8,108	1,562	3,276	2,788	17,574	--	45,396
1974	994	999	--	8,859	1,682	3,299	2,926	17,623	--	47,035
1975	1,143	1,147	--	9,291	1,912	3,482	2,846	18,178	--	48,838
1976	1,165	1,421	--	9,961	2,064	3,856	3,285	18,708	--	52,153
1977	1,389	2,083	--	10,537	2,288	4,566	3,592	18,692	--	55,199
1978	1,459	1,713	--	11,532	2,500	4,840	3,957	19,031	--	58,886
1979	1,655	1,945	--	12,260	2,699	5,430	3,932	19,378	--	62,503
1980	1,715	2,179	284	12,067	2,888	5,405	4,602	19,861	--	64,144

APPENDIX TABLE 28. EMPLOYMENT BY ECONOMIC SECTOR, WYOMING REGION 4, 1960-1980

Year	Sector (1) & (2) Agric	(3) Metal Mining	(4) Coal Mining	(5) Pet/NG Exp/Ext	(6) Nonmetallic Mining	(7) Constr	(8) Lumber	(9) Ag Proc & Misc Mfg	(10) Pet Refining	(11) Metal Proc
1960	1,154	--	119	645	930	1,157	92	1,052	--	--
1961	1,143	--	132	668	936	1,277	112	1,154	--	--
1962	1,130	--	147	692	936	1,401	134	1,263	--	--
1963	1,119	--	172	1,109	944	1,150	129	1,176	--	--
1964	1,108	--	192	1,350	860	881	130	1,088	--	--
1965	1,103	--	137	922	782	673	165	1,525	--	--
1966	1,100	--	268	944	720	627	162	1,549	--	--
1967	1,095	--	201	726	930	876	160	1,293	--	--
1968	1,092	--	221	928	1,063	781	153	1,281	--	--
1969	1,087	--	241	1,088	1,201	694	158	1,313	--	--
1970	1,074	--	217	986	1,121	927	170	1,417	--	--
1971	1,062	--	119	743	1,257	917	128	1,998	99	--
1972	1,051	--	118	918	1,254	1,695	90	1,261	70	--
1973	1,039	--	116	1,203	1,516	3,081	276	1,169	71	--
1974	1,026	--	798	1,925	2,731	1,635	302	1,195	117	--
1975	1,050	--	678	2,625	3,196	1,263	268	1,121	100	--
1976	1,074	--	655	2,188	3,382	1,362	337	1,018	95	--
1977	1,096	--	945	556	4,396	1,488	383	1,727	97	--
1978	1,119	--	1,455	779	3,748	1,657	484	1,617	105	--
1979	1,140	249	1,503	1,031	3,554	1,954	462	1,921	91	--
1980	1,164	252	1,726	1,310	4,807	2,045	416	2,105	90	--

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APPENDIX TABLE 28. EMPLOYMENT BY ECONOMIC SECTOR, WYOMING REGION 4, 1960-1980 (CONTINUED)

	Sector									
Year	(12) Trans	(13) Comm & Pub Util	(14) Elec Gen	(15) Retail Trade	(16) FIRE	(17) Bus & Pers Service	(18) Prof & Soc Serv	(19) Govt	(20) Households	TOTAL
1960	626	706	--	2,617	344	954	635	2,891	--	13,922
1961	657	741	--	2,779	363	1,014	679	2,996	--	14,651
1962	687	774	--	2,948	384	1,074	717	3,096	--	15,383
1963	601	324	243	2,909	390	990	661	3,054	--	14,971
1964	498	750	271	2,774	375	865	577	2,993	--	14,712
1965	563	837	298	2,950	485	889	643	2,929	--	14,901
1966	589	811	294	2,876	365	957	723	2,946	--	14,931
1967	587	807	297	2,894	462	974	763	2,926	--	14,991
1968	724	720	357	2,810	446	973	763	3,109	--	15,421
1969	656	659	436	2,756	432	972	761	3,058	--	15,512
1970	639	752	513	2,818	458	972	763	2,979	--	15,806
1971	700	855	635	3,085	409	1,017	799	3,145	--	16,968
1972	627	736	392	2,778	385	919	785	2,879	--	15,958
1973	689	808	434	3,056	361	1,004	856	3,045	--	18,724
1974	770	770	448	4,462	596	1,327	1,177	3,226	--	22,505
1975	729	734	453	4,421	652	1,261	1,029	3,438	--	23,018
1976	743	910	881	5,042	611	1,275	1,087	3,740	--	24,400
1977	728	1,090	1,214	4,994	737	1,618	1,271	3,929	--	26,269
1978	876	1,030	1,015	5,808	819	1,983	1,621	3,993	--	28,109
1979	905	1,064	930	6,398	897	2,395	1,731	4,315	--	30,540
1980	917	1,167	912	6,387	930	2,205	1,879	4,543	--	32,855

APPENDIX TABLE 29. EMPLOYMENT BY ECONOMIC SECTOR, WYOMING REGION 5, 1960-1980

Year	Sector (1) & (2) Agric	(3) Metal Mining	(4) Coal Mining	(5) Pet/NG Exp/Ext	(6) Nonmetallic Mining	(7) Constr	(8) Lumber	(9) Ag Proc & Misc Mfg	(10) Pet Refining	(11) Metal Proc
1960	1,140	903	--	291	37	1,025	214	381	--	239
1961	1,125	1,061	--	341	49	1,218	252	479	--	281
1962	1,112	1,224	--	394	64	1,417	290	579	--	324
1963	1,097	1,181	--	359	48	942	266	579	--	463
1964	1,083	1,238	--	356	33	586	268	617	--	627
1965	1,039	878	--	347	49	814	289	650	--	740
1966	996	1,034	--	287	48	801	274	749	--	797
1967	953	1,111	--	202	56	688	254	699	--	702
1968	910	1,195	--	225	58	699	298	847	--	724
1969	866	1,233	--	239	57	694	330	988	--	718
1970	855	1,435	--	200	70	896	349	933	--	696
1971	843	1,378	--	146	106	879	346	846	--	537
1972	833	1,190	--	136	90	992	242	753	--	517
1973	821	1,147	--	122	122	943	191	768	--	421
1974	810	1,135	--	769	30	1,083	113	1,055	--	340
1975	835	1,302	--	812	29	1,057	107	977	--	472
1976	860	1,547	--	528	28	1,198	146	1,168	--	498
1977	885	2,152	--	210	64	1,587	196	1,478	--	624
1978	909	2,229	--	287	49	2,245	153	1,676	--	641
1979	934	2,631	--	248	95	2,305	137	1,735	--	684
1980	959	2,820	--	540	62	2,168	68	1,643	--	640

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APPENDIX TABLE 29. EMPLOYMENT BY ECONOMIC SECTOR, WYOMING REGION 5, 1960-1980 (CONTINUED)

	Sector									
Year	(12) Trans	(13) Comm & Pub Util	(14) Elec Gen	(15) Retail Trade	(16) FIRE	(17) Bus & Pers Service	(18) Prof & Soc Serv	(19) Govt	(20) Households	TOTAL
1960	202	228	--	1,762	239	708	473	2,378	--	10,220
1961	244	274	--	2,143	287	893	596	2,547	--	11,790
1962	285	323	--	2,539	338	1,087	724	2,663	--	13,363
1963	233	300	--	2,307	318	1,008	669	2,600	--	12,370
1964	203	302	--	2,255	323	998	665	2,526	--	12,080
1965	173	262	--	2,528	322	1,227	889	2,451	--	12,658
1966	202	283	--	2,389	302	1,170	884	2,446	--	12,662
1967	185	255	--	2,236	276	1,179	927	2,405	--	12,128
1968	230	270	--	2,351	295	1,215	958	2,583	--	12,858
1969	273	276	--	2,453	309	1,271	999	2,553	--	13,259
1970	232	273	--	2,455	343	1,316	1,035	2,582	--	13,670
1971	233	286	--	2,590	333	1,472	1,155	2,761	--	13,911
1972	245	290	--	2,647	336	1,376	1,171	2,629	--	13,447
1973	244	289	--	2,854	354	1,488	1,266	2,731	--	13,761
1974	250	251	--	2,884	412	1,391	1,233	2,751	--	14,507
1975	289	290	--	2,851	470	1,709	1,399	2,895	--	15,494
1976	327	401	--	3,267	478	1,923	1,638	3,074	--	17,081
1977	307	459	--	3,604	633	2,004	1,573	3,219	--	18,995
1978	401	467	--	4,193	608	2,076	1,699	3,277	--	20,910
1979	431	507	--	4,456	762	2,417	1,750	3,436	--	22,528
1980	447	570	--	4,504	738	2,383	2,031	3,626	--	23,199

APPENDIX TABLE 30. EMPLOYMENT BY ECONOMIC SECTOR, WYOMING REGION 6, 1960-1980

Year	Sector (1) & (2) Agric	(3) Metal Mining	(4) Coal Mining	(5) Pet/NG Exp/Ext	(6) Nonmetallic Mining	(7) Constr	(8) Lumber	(9) Ag Proc & Misc Mfg	(10) Pet Refining	(11) Metal Proc
1960	1,879	--	--	1,085	209	849	289	1,265	489	--
1961	1,830	--	--	1,191	227	930	314	1,379	550	--
1962	1,783	--	--	1,293	246	1,011	336	1,491	608	--
1963	1,734	--	--	1,553	182	1,100	325	1,575	601	--
1964	1,687	--	--	1,817	123	1,218	318	1,696	600	--
1965	1,651	--	25	1,528	192	1,159	340	1,562	893	--
1966	1,614	--	17	1,446	345	1,146	322	1,495	844	--
1967	1,578	--	19	1,346	477	974	298	1,541	574	--
1968	1,541	--	19	1,559	324	941	298	1,928	457	--
1969	1,505	--	19	1,687	151	866	287	2,196	309	--
1970	1,485	--	8	1,136	303	790	329	2,561	317	--
1971	1,466	--	11	1,230	322	788	332	2,348	329	--
1972	1,444	--	15	1,372	372	839	337	2,256	291	--
1973	1,425	--	13	1,410	447	1,020	325	2,364	278	--
1974	1,405	--	6	2,217	253	1,001	301	2,570	223	--
1975	1,428	--	--	2,827	75	1,293	357	2,723	--	--
1976	1,453	--	3	2,626	158	1,353	364	2,980	222	--
1977	1,475	--	3	893	265	1,757	426	3,566	288	--
1978	1,498	--	2	865	394	1,968	383	3,542	274	--
1979	1,521	--	4	1,150	378	1,925	378	3,878	250	--
1980	1,546	--	7	1,021	443	2,047	415	3,899	258	--

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APPENDIX TABLE 30. EMPLOYMENT BY ECONOMIC SECTOR, WYOMING REGION 6, 1960-1980 (CONTINUED)

	Sector									
Year	(12) Trans	(13) Comm & Pub Util	(14) Elec Gen	(15) Retail Trade	(16) FIRE	(17) Bus & Pers Service	(18) Prof & Soc Serv	(19) Govt	(20) Households	TOTAL
1960	504	565	--	2,906	455	920	611	3,644	--	15,670
1961	549	615	--	3,173	497	1,006	669	3,711	--	16,641
1962	594	663	--	3,429	537	1,089	724	3,801	--	17,605
1963	519	670	--	3,224	473	1,189	718	3,648	--	17,511
1964	468	697	--	3,106	527	1,102	732	3,488	--	17,579
1965	477	717	--	3,363	608	1,189	862	3,335	--	17,901
1966	523	717	--	3,596	559	1,109	836	3,274	--	17,843
1967	477	662	--	3,216	520	1,078	847	3,234	--	16,841
1968	548	641	--	3,342	559	1,163	912	3,381	--	17,613
1969	589	591	--	3,302	575	1,186	934	3,247	--	17,444
1970	447	522	--	3,151	535	1,140	898	3,250	--	16,872
1971	449	552	--	3,259	584	1,178	923	3,466	--	17,237
1972	445	520	--	3,301	621	1,178	1,005	3,189	--	17,185
1973	466	543	--	3,387	587	1,220	1,039	3,296	--	17,820
1974	512	513	--	3,140	613	1,119	992	3,183	--	18,048
1975	549	552	--	3,520	621	1,221	999	3,361	--	19,526
1976	575	702	--	3,630	714	1,373	1,168	3,513	--	20,834
1977	573	859	--	4,465	861	1,669	1,312	3,756	--	22,168
1978	660	775	--	4,565	851	1,801	1,477	3,879	--	22,934
1979	628	738	--	4,410	892	2,163	1,565	3,712	--	23,592
1980	624	795	--	4,339	964	1,754	1,490	3,802	--	23,404

APPENDIX TABLE 31. EMPLOYMENT BY ECONOMIC SECTOR, WYOMING, 1960-1980

Year	Sector (1) & (2) Agric	(3) Metal Mining	(4) Coal Mining	(5) Pet/NG Exp/Ext	(6) Nonmetallic Mining	(7) Constr	(8) Lumber	(9) Ag Proc & Misc Mfg	(10) Pet Refining	(11) Metal Proc
1960	9,604	1,360	271	5,764	1,493	8,107	1,458	9,845	3,545	409
1961	9,461	1,523	306	6,126	1,534	8,515	1,567	10,301	3,619	447
1962	9,321	1,689	339	6,481	1,570	8,925	1,674	10,760	3,691	485
1963	9,178	1,652	404	7,653	1,477	8,763	1,684	10,903	3,141	622
1964	9,038	1,747	438	8,519	1,305	8,437	1,701	11,063	2,579	798
1965	8,996	1,712	364	7,507	1,269	7,613	1,800	10,704	2,762	893
1966	8,960	1,529	482	6,804	1,416	6,871	1,574	10,942	2,716	952
1967	8,916	1,568	413	6,510	1,752	6,455	1,277	10,377	2,258	841
1968	8,880	1,803	440	7,636	1,903	6,557	1,326	11,113	2,021	861
1969	8,838	1,935	455	8,027	2,097	6,697	1,367	11,832	1,767	834
1970	8,672	2,111	666	8,003	2,112	6,628	1,744	11,729	1,813	816
1971	8,510	2,089	747	6,900	2,410	6,936	1,437	12,273	1,781	649
1972	8,346	1,646	644	7,175	2,468	7,824	1,544	10,537	1,862	629
1973	8,184	1,938	554	7,610	2,431	10,029	1,559	11,234	1,589	531
1974	8,018	2,254	1,619	9,241	3,762	9,378	1,515	13,014	1,699	466
1975	8,138	2,841	1,699	11,516	3,970	9,820	1,334	14,107	982	600
1976	8,263	3,277	1,826	11,146	4,179	11,412	1,863	13,909	1,847	623
1977	8,378	4,326	3,102	6,608	6,013	13,457	2,276	16,617	1,615	747
1978	8,495	5,399	4,308	8,325	5,193	16,649	2,461	17,506	1,575	765
1979	8,612	6,233	5,686	8,906	5,178	18,981	2,211	19,559	1,662	841
1980	8,738	6,633	6,709	10,932	6,553	18,017	2,158	19,829	1,728	782

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APPENDIX TABLE 31. EMPLOYMENT BY ECONOMIC SECTOR, WYOMING, 1960-1980 (CONTINUED)

	Sector									
Year	(12) Trans	(13) Comm & Pub Util	(14) Elec Gen	(15) Retail Trade	(16) FIRE	(17) Bus & Pers Service	(18) Prof & Soc Serv	(19) Govt	(20) Households	TOTAL
1960	4,288	4,836	804	23,545	4,432	8,373	5,583	32,212	--	125,929
1961	4,407	4,967	877	24,317	4,454	8,589	5,732	33,254	--	129,996
1962	4,519	5,095	946	25,091	4,485	8,813	5,877	34,299	--	134,060
1963	4,024	4,743	1,060	25,489	4,489	8,934	5,881	34,415	--	134,512
1964	3,466	5,197	917	25,519	4,480	8,668	5,770	34,257	--	133,899
1965	3,331	4,996	1,056	25,474	4,492	9,162	6,635	33,957	--	132,723
1966	3,643	5,025	1,037	25,691	4,430	9,118	6,888	33,718	--	131,796
1967	3,515	4,860	986	24,672	4,485	8,856	6,961	32,558	--	127,260
1968	4,029	4,590	967	24,931	4,586	9,264	7,286	34,207	--	132,400
1969	4,362	4,386	980	25,246	4,753	9,709	7,632	33,836	--	134,753
1970	3,876	4,551	1,056	25,406	4,811	9,809	7,705	33,708	--	135,216
1971	3,794	4,640	1,051	25,610	4,608	10,256	8,055	35,814	--	137,560
1972	3,554	4,175	981	23,791	4,458	9,222	7,826	33,926	--	130,608
1973	3,807	4,469	968	25,310	4,532	9,922	8,447	35,099	--	138,213
1974	3,793	3,806	725	28,235	5,110	10,494	9,306	35,449	--	147,884
1975	4,340	4,355	707	30,816	5,809	11,631	9,510	36,717	--	158,892
1976	4,672	5,712	1,257	33,149	6,374	12,445	10,605	38,442	--	171,001
1977	4,779	7,166	1,653	35,833	7,376	14,789	11,622	39,650	--	186,007
1978	5,473	6,423	1,521	39,900	7,675	15,837	12,959	40,532	--	200,996
1979	5,934	6,969	1,401	42,082	8,514	18,933	13,706	41,598	--	217,006
1980	5,692	7,243	1,665	41,171	8,940	17,861	15,207	43,143	--	223,001

APPENDIX TABLE 32. GROSS BUSINESS VOLUME TO EMPLOYMENT (PRODUCTIVITY) RATIOS, BY ECONOMIC SECTOR, WYOMING REGION 2, 1960-1980, (1980 = BASE DOLLARS)

Year	Sector									
	(1) & (2) Agric	(3) Metal Mining	(4) Coal Mining	(5) Pet/NG Exp/Ext	(6) Nonmetallic Mining	(7) Constr	(8) Lumber	(9) Ag Proc & Misc Mfg	(10) Pet Refining	(11) Metal Proc
1960	165,197	22,051	462,500	95,732	36,047	28,762	14,286	51,156	65,038	--
1961	159,255	8,293	588,890	85,555	28,571	26,237	11,475	48,536	62,082	--
1962	165,299	11,215	577,780	92,518	30,208	27,108	10,606	46,982	75,886	--
1963	165,529	13,942	305,260	86,627	39,241	31,430	10,769	45,999	96,736	--
1964	158,107	5,607	262,960	81,020	41,177	30,133	11,864	42,385	131,302	--
1965	162,821	7,033	163,040	92,125	55,224	36,516	9,722	49,172	133,892	--
1966	175,803	5,625	338,460	102,357	56,604	43,485	10,000	49,133	142,872	--
1967	159,389	952	638,460	100,686	54,902	47,550	11,111	49,824	139,503	--
1968	167,929	3,318	541,670	92,251	30,588	29,960	13,636	47,152	127,865	--
1969	172,777	3,349	710,000	94,479	18,563	28,896	13,044	46,260	143,828	--
1970	177,803	7,729	3,900,000	86,650	27,119	35,061	11,594	48,339	140,040	--
1971	193,099	5,405	268,180	86,917	47,826	28,372	17,910	42,544	173,798	--
1972	225,362	61,538	164,520	77,752	38,044	30,080	19,444	55,994	175,621	--
1973	274,250	111,429	503,700	100,807	35,398	31,313	27,119	60,506	206,135	--
1974	232,124	29,446	350,000	251,406	18,723	34,972	14,943	44,723	345,064	--
1975	239,773	8,094	141,120	230,550	35,099	39,606	8,411	37,066	859,217	--
1976	244,828	5,865	176,040	198,047	32,484	31,062	15,556	51,005	342,857	--
1977	267,711	11,991	1,655,560	167,030	8,615	30,373	19,149	51,028	471,620	--
1978	284,353	9,411	191,750	132,278	14,528	29,021	19,588	46,391	513,981	--
1979	315,862	13,227	90,050	174,714	17,172	24,055	10,638	39,176	573,182	--
1980	272,247	14,033	55,950	185,076	16,463	35,204	15,232	35,982	911,429	--

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APPENDIX TABLE 32. GROSS BUSINESS VOLUME TO EMPLOYMENT (PRODUCTIVITY) RATIOS, BY ECONOMIC SECTOR, WYOMING REGION 2, 1960-1980, (1980 = BASE DOLLARS) (CONTINUED)

	Sector								
Year	(12) Trans	(13) Comm & Pub Util	(14) Elec Gen	(15) Retail Trade	(16) FIRE	(17) Bus & Pers Service	(18) Prof & Soc Serv	(19) Govt	(20) Households
1960	6,977	27,663	27,040	58,113	40,180	17,959	19,283	6,196	--
1961	6,256	25,490	34,214	55,001	37,572	17,745	17,837	5,847	--
1962	6,618	26,016	31,429	55,697	37,808	18,043	18,037	6,035	--
1963	7,917	29,355	36,992	62,800	44,465	19,676	21,126	7,039	--
1964	8,479	26,569	60,072	57,020	39,964	18,515	18,197	6,596	--
1965	9,123	27,266	50,377	58,152	41,268	19,094	16,456	6,714	--
1966	8,243	27,987	58,552	58,448	41,223	21,470	17,378	6,832	--
1967	8,373	29,658	61,730	63,363	44,132	24,494	17,592	6,613	--
1968	7,396	31,167	51,032	62,924	39,878	23,730	16,654	6,340	--
1969	7,285	35,283	69,631	66,071	39,292	24,542	17,090	6,426	--
1970	8,168	33,601	81,046	65,477	42,476	25,040	16,576	6,628	--
1971	8,758	34,361	72,543	68,448	45,624	23,264	15,268	6,419	--
1972	9,666	39,549	84,045	78,499	52,089	32,078	19,939	7,553	--
1973	10,969	43,801	136,042	89,621	62,596	30,074	21,328	8,799	--
1974	19,651	77,762	200,000	70,255	60,833	23,443	16,606	8,755	--
1975	17,412	70,388	202,979	64,703	55,736	21,112	17,679	9,749	--
1976	12,181	41,435	143,478	64,690	45,217	21,358	16,946	9,252	--
1977	14,143	38,058	162,563	66,116	44,139	18,554	16,547	9,232	--
1978	12,769	44,732	175,150	57,313	44,408	17,966	15,599	9,321	--
1979	13,082	44,195	187,541	60,793	45,127	15,901	16,345	10,454	--
1980	20,032	56,096	153,988	66,617	45,151	17,422	15,566	10,819	--

APPENDIX TABLE 33. GROSS BUSINESS VOLUME TO EMPLOYMENT (PRODUCTIVITY) RATIOS, BY ECONOMIC SECTOR, WYOMING REGION 3, 1960-1980, (1980 = BASE DOLLARS)

Year	Sector									
	(1) & (2) Agric	(3) Metal Mining	(4) Coal Mining	(5) Pet/NG Exp/Ext	(6) Nonmetallic Mining	(7) Constr	(8) Lumber	(9) Ag Proc & Misc Mfg	(10) Pet Refining	(11) Metal Proc
1960	111,341	7,634	21,429	498,220	35,211	29,865	5,794	47,936	94,470	19,412
1961	109,964	42,413	48,276	508,800	36,029	31,729	6,262	48,759	100,270	26,506
1962	111,958	40,239	62,069	515,310	37,984	35,509	6,182	51,113	104,830	18,012
1963	113,931	26,996	70,000	411,150	59,000	37,046	5,574	49,767	106,980	19,497
1964	104,673	14,237	62,069	360,140	77,778	30,861	5,016	49,235	122,580	22,222
1965	102,097	28,287	55,172	324,830	155,882	40,729	5,220	55,048	133,200	22,222
1966	118,423	4,478	39,535	338,210	115,556	46,076	13,805	53,513	113,250	22,581
1967	117,642	14 575	16,000	212,730	152,941	41,845	10,606	58,400	113,360	23,741
1968	120,234	11,083	17,582	232,340	33,333	51,282	10,526	55,497	147,340	23,358
1969	121,647	12,576	24,675	250,570	21,711	61,746	10,134	55,088	201,150	33,621
1970	122,026	24,307	38,406	289,580	20,052	57,238	7,426	54,988	247,800	35,000
1971	127,764	40,929	20,333	341,330	14,237	55,450	14,628	63,615	247,030	33,929
1972	164,341	62,466	66,848	356,690	15,033	54,528	20,000	76,923	185,100	33,929
1973	200,000	24,344	80,062	416,980	64,881	57,541	24,812	64,786	337,640	27,273
1974	162,310	10,309	66,614	444,470	44,348	48,731	13,034	58,289	741,740	23,016
1975	157,041	14,216	100,000	493,140	79,605	73,388	11,491	60,185	886,750	24,219
1976	153,280	26,135	111,554	521,170	60,335	40,417	17,161	57,504	939,090	26,400
1977	165,357	38,797	106,468	2,473,910	53,571	42,873	13,435	57,866	987,890	22,764
1978	184,220	34,294	125,386	984,380	61,321	36,990	12,438	60,764	909,330	26,613
1979	218,118	21,047	85,468	1,827,620	62,738	40,794	18,290	67,295	1,165,890	20,382
1980	192,773	20,297	79,541	1,497,880	57,329	47,556	16,881	60,120	1,660,330	12,676

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APPENDIX TABLE 33. GROSS BUSINESS VOLUME TO EMPLOYMENT (PRODUCTIVITY) RATIOS, BY ECONOMIC SECTOR, WYOMING REGION 3, 1960-1980, (1980 = BASE DOLLARS) (CONTINUED)

	Sector								
Year	(12) Trans	(13) Comm & Pub Util	(14) Elec Gen	(15) Retail Trade	(16) FIRE	(17) Bus & Pers Service	(18) Prof & Soc Serv	(19) Govt	(20) Households
1960	5,891	33,040	--	43,323	40,485	14,181	17,769	3,244	--
1961	6,667	35,051	--	45,654	43,739	15,900	18,853	3,050	--
1962	7,232	38,648	--	49,692	49,426	18,076	21,145	2,990	--
1963	8,544	44,862	--	58,000	60,717	20,314	26,540	3,749	--
1964	8,905	38,980	--	51,392	55,446	19,958	23,377	3,129	--
1965	10,000	42,266	--	52,760	55,760	19,661	19,646	2,913	--
1966	9,729	46,683	--	55,797	55,402	20,406	19,113	3,139	--
1967	9,688	46,279	--	59,195	55,044	21,994	19,572	3,515	--
1968	9,372	51,745	--	60,707	56,021	22,160	18,774	3,326	--
1969	8,866	57,265	--	62,100	56,008	21,962	17,871	3,473	--
1970	10,466	55,242	--	64,584	57,107	23,153	18,292	3,565	--
1971	11,585	57,348	--	67,092	57,671	22,913	18,265	3,402	--
1972	14,070	72,978	--	83,908	70,989	26,915	21,277	4,125	--
1973	15,304	91,421	--	101,443	98,400	30,556	29,197	5,639	--
1974	13,883	84,785	--	75,945	72,176	25,856	21,668	4,477	--
1975	13,473	78,030	--	73,996	65,167	24,469	22,945	4,483	--
1976	13,906	63,547	--	68,828	60,320	22,381	20,122	4,383	--
1977	12,743	47,048	--	69,555	58,960	19,711	20,072	4,761	--
1978	13,297	61,588	--	68,132	58,320	19,649	19,661	5,050	--
1979	13,354	61,697	--	71,868	61,023	19,208	22,228	5,604	--
1980	15,219	58,192	117,606	73,606	57,756	19,612	19,122	5,574	--

APPENDIX TABLE 34. GROSS BUSINESS VOLUME TO EMPLOYMENT (PRODUCTIVITY) RATIOS, BY ECONOMIC SECTOR, WYOMING REGION 4, 1960-1980, (1980 = BASE DOLLARS)

	Sector									
Year	(1) & (2) Agric	(3) Metal Mining	(4) Coal Mining	(5) Pet/NG Exp/Ext	(6) Nonmetallic Mining	(7) Constr	(8) Lumber	(9) Ag Proc & Misc Mfg	(10) Pet Refining	(11) Metal Proc
1960	89,601	--	15,966	138,450	8,602	27,312	75,000	46,293	--	--
1961	84,077	--	15,152	180,090	7,372	26,782	61,607	41,335	--	--
1962	90,796	--	12,245	154,769	9,188	24,340	52,239	40,855	--	--
1963	87,578	--	27,907	96,303	10,170	35,652	53,488	42,517	--	--
1964	88,267	--	21,354	82,148	12,791	44,381	53,077	43,750	--	--
1965	98,549	--	30,657	112,581	15,985	63,002	42,424	32,590	--	--
1966	109,091	--	17,537	104,343	19,861	62,042	46,296	35,055	--	--
1967	102,922	--	22,886	131,405	15,807	43,607	48,750	40,526	--	--
1968	112,088	--	28,959	101,509	17,780	59,539	63,399	45,355	--	--
1969	119,227	--	36,100	94,577	21,232	57,781	69,620	48,134	--	--
1970	115,922	--	49,770	100,913	29,349	40,022	54,118	43,825	--	--
1971	122,411	--	105,882	132,436	25,378	37,950	94,531	32,833	8,081	--
1972	143,102	--	124,576	100,327	28,788	30,030	140,000	57,891	17,143	--
1973	171,126	--	205,172	86,949	29,288	14,898	57,246	75,021	14,085	--
1974	138,889	--	45,489	70,857	21,348	28,991	32,450	72,301	20,513	--
1975	141,333	--	70,206	63,924	21,902	42,280	34,328	77,520	42,000	--
1976	146,182	--	120,611	106,490	26,996	48,091	35,905	94,303	194,737	--
1977	157,482	--	112,593	468,885	24,682	49,933	44,125	62,189	69,072	--
1978	170,420	--	74,021	400,770	27,375	51,298	32,645	70,872	76,190	--
1979	192,544	--	93,413	439,573	36,185	49,130	31,818	68,662	131,868	--
1980	173,282	--	101,738	528,626	31,392	60,147	20,913	62,423	125,556	--

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APPENDIX TABLE 34. GROSS BUSINESS VOLUME TO EMPLOYMENT (PRODUCTIVITY) RATIOS, BY ECONOMIC SECTOR, WYOMING REGION 4, 1960-1980, (1980 = BASE DOLLARS) (CONTINUED)

	Sector								
Year	(12) Trans	(13) Comm & Pub Util	(14) Elec Gen	(15) Retail Trade	(16) FIRE	(17) Bus & Pers Service	(18) Prof & Soc Serv	(19) Govt	(20) Households
1960	6,230	29,603	--	64,310	78,198	27,149	21,732	6,122	--
1961	6,545	29,420	--	62,325	74,380	27,022	20,471	5,975	--
1962	6,259	28,941	--	61,703	72,917	27,281	20,084	5,976	--
1963	7,820	80,864	72,428	72,396	88,462	32,828	26,778	7,335	--
1964	9,438	33,333	43,911	73,504	84,800	38,150	28,076	6,950	--
1965	8,348	30,227	39,933	71,661	66,392	39,258	25,350	7,204	--
1966	8,319	32,676	46,259	77,886	92,877	39,185	23,652	7,536	--
1967	8,348	33,333	44,444	79,993	74,026	40,657	22,674	7,690	--
1968	7,320	40,833	65,826	89,431	84,305	44,296	24,640	7,880	--
1969	8,842	48,710	63,532	98,186	93,981	48,045	26,675	8,666	--
1970	9,390	44,415	62,768	100,603	91,048	51,029	27,130	9,131	--
1971	8,714	39,766	62,362	93,290	105,134	49,558	26,658	8,871	--
1972	10,367	49,592	111,224	110,619	121,039	57,563	29,172	10,490	--
1973	10,740	52,847	144,931	112,238	154,571	55,578	32,009	11,757	--
1974	10,130	55,584	187,054	72,568	90,101	39,186	21,920	10,632	--
1975	12,209	65,940	241,501	78,828	93,098	42,268	28,280	11,228	--
1976	14,939	64,615	166,629	78,639	118,494	45,333	31,831	12,246	--
1977	17,445	62,752	157,908	89,267	115,739	38,628	32,179	13,642	--
1978	15,525	69,709	170,837	80,596	108,181	32,527	26,527	14,075	--
1979	18,895	80,733	223,118	83,339	114,493	29,645	28,712	15,156	--
1980	23,555	87,147	199,561	93,048	121,828	34,422	29,963	16,201	--

APPENDIX TABLE 35. GROSS BUSINESS VOLUME TO EMPLOYMENT (PRODUCTIVITY) RATIOS, BY ECONOMIC SECTOR, WYOMING REGION 5, 1960-1980, (1980 = BASE DOLLARS)

	Sector									
Year	(1) & (2) Agric	(3) Metal Mining	(4) Coal Mining	(5) Pet/NG Exp/Ext	(6) Nonmetallic Mining	(7) Constr	(8) Lumber	(9) Ag Proc & Misc Mfg	(10) Pet Refining	(11) Metal Proc
1960	63,772	20,709	--	248,454	37,838	23,122	29,439	89,501	--	47,280
1961	40,800	17,531	--	206,452	24,490	18,145	24,603	51,357	--	39,858
1962	66,637	15,114	--	165,736	21,875	16,514	21,724	60,276	--	34,568
1963	68,095	17,866	--	171,309	35,417	29,724	24,060	60,967	--	27,430
1964	66,759	15,267	--	173,034	45,455	44,369	23,507	55,754	--	18,341
1965	74,495	17,995	--	178,098	32,653	34,152	22,145	56,000	--	12,973
1966	85,843	17,311	--	205,575	33,333	32,584	25,182	53,672	--	13,551
1967	87,303	16 562	--	310,891	28,571	38,954	31,102	57,225	--	15,812
1968	99,231	16,569	--	263,111	29,310	42,919	30,201	51,948	--	16,575
1969	106,005	16,140	--	231,381	33,333	38,761	35,455	45,951	--	16,713
1970	101,754	18,188	--	275,500	27,143	31,027	24,355	48,875	--	15,661
1971	106,643	13,933	--	380,137	17,925	32,537	23,121	54,255	--	19,739
1972	121,008	21,345	--	394,853	20,000	22,480	38,430	66,534	--	24,371
1973	138,611	15,868	--	436,885	16,393	25,557	58,639	71,354	--	32,542
1974	101,605	14,097	--	82,055	63,333	24,746	61,947	41,896	--	47,941
1975	103,832	12,980	--	69,828	65,517	24,220	62,617	47,902	--	39,195
1976	106,279	23,400	--	126,705	78,571	25,793	63,699	42,723	--	39,558
1977	117,853	21,608	--	476,190	35,938	21,487	65,306	40,122	--	32,853
1978	119,032	15,523	--	331,010	44,898	14,744	76,471	37,769	--	27,769
1979	129,550	9,996	--	550,806	29,474	21,518	78,102	39,885	--	23,392
1980	114,494	10,674	--	300,000	335,484	22,279	100,000	39,440	--	27,500

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APPENDIX TABLE 35. GROSS BUSINESS VOLUME TO EMPLOYMENT (PRODUCTIVITY) RATIOS, BY ECONOMIC SECTOR, WYOMING REGION 5, 1960-1980, (1980 = BASE DOLLARS) (CONTINUED)

	Sector								
Year	(12) Trans	(13) Comm & Pub Util	(14) Elec Gen	(15) Retail Trade	(16) FIRE	(17) Bus & Pers Service	(18) Prof & Soc Serv	(19) Govt	(20) Households
1960	21,782	80,263	--	82,917	99,163	32,203	26,004	6,686	--
1961	17,213	60,584	--	63,789	72,474	25,644	18,289	5,536	--
1962	15,439	57,276	--	60,693	70,414	23,275	17,127	6,008	--
1963	21,030	73,333	--	78,717	92,138	28,274	23,169	7,538	--
1964	22,660	66,887	--	76,452	81,734	28,758	20,752	7,007	--
1965	25,434	76,336	--	69,067	80,124	24,205	14,961	7,058	--
1966	23,267	73,852	--	77,606	90,066	27,436	15,837	7,441	--
1967	26,487	85,882	--	87,567	102,899	29,093	15,858	7,900	--
1968	23,044	94,815	--	96,299	115,254	31,605	18,685	8,788	--
1969	19,780	94,565	--	96,046	112,298	32,337	18,318	9,048	--
1970	24,138	93,040	--	96,008	96,501	32,447	16,618	8,598	--
1971	22,318	84,615	--	88,456	94,294	28,601	14,026	7,606	--
1972	23,265	86,552	--	89,158	96,429	31,759	14,261	8,292	--
1973	22,541	91,350	--	85,669	98,588	29,704	14,297	8,568	--
1974	20,400	96,414	--	77,601	75,485	29,116	13,139	7,597	--
1975	17,647	80,690	--	76,359	64,255	23,054	11,151	7,047	--
1976	20,489	66,584	--	72,207	71,548	21,685	10,806	7,547	--
1977	26,710	68,410	--	72,558	63,349	22,006	13,350	8,450	--
1978	17,955	61,884	--	59,576	60,526	21,002	11,183	7,598	--
1979	17,633	62,525	--	60,278	51,837	19,115	11,600	7,742	--
1980	19,239	62,281	--	62,966	57,046	20,017	10,635	7,915	--

APPENDIX TABLE 36. GROSS BUSINESS VOLUME TO EMPLOYMENT (PRODUCTIVITY) RATIOS, BY ECONOMIC SECTOR, WYOMING REGION 6, 1960-1980, (1980 = BASE DOLLARS)

	Sector									
Year	(1) & (2) Agric	(3) Metal Mining	(4) Coal Mining	(5) Pet/NG Exp/Ext	(6) Nonmetallic Mining	(7) Constr	(8) Lumber	(9) Ag Proc & Misc Mfg	(10) Pet Refining	(11) Metal Proc
1960	76,849	--	--	302,488	15,311	62,426	5,190	55,099	58,282	--
1961	76,230	--	--	281,780	14,537	57,312	4,771	49,746	58,545	--
1962	74,986	--	--	252,204	14,634	51,830	4,464	46,077	51,480	--
1963	84,487	--	--	202,898	21,429	51,727	4,615	45,333	48,918	--
1964	83,995	--	--	168,905	31,707	44,253	4,717	41,451	51,833	--
1965	91,157	--	4,000	188,285	22,396	46,592	3,824	48,015	35,386	--
1966	107,187	--	5,882	190,318	13,044	45,288	7,143	54,716	36,256	--
1967	101,901	--	5,263	205,126	8,386	52,875	5,369	50,357	59,756	--
1968	114,925	--	5,263	171,905	14,198	55,473	7,718	43,205	50,109	--
1969	114,684	--	5,263	153,705	31,788	54,042	10,453	37,978	71,521	--
1970	107,879	--	12,500	207,218	16,502	58,101	8,207	31,121	70,662	--
1971	118,417	--	9,091	188,862	14,596	61,168	8,735	35,009	68,389	--
1972	129,640	--	6,667	154,155	12,634	53,635	11,276	39,894	76,289	--
1973	163,509	--	7,692	159,929	12,081	49,216	17,539	43,613	86,691	--
1974	158,861	--	16,667	154,759	26,878	61,738	10,631	37,665	195,964	--
1975	132,843	--	--	131,694	96,000	54,679	5,602	35,659	--	--
1976	133,104	--	33,333	142,422	50,000	47,007	10,165	35,000	206,757	--
1977	138,508	--	33,333	414,110	33,585	37,678	9,390	31,408	180,556	--
1978	158,945	--	50,000	429,133	25,127	37,449	12,010	35,432	183,942	--
1979	174,162	--	50,000	353,652	31,746	37,662	10,847	35,353	256,800	--
1980	160,608	--	57,143	735,064	26,862	56,278	9,157	33,265	379,070	--

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APPENDIX TABLE 36. GROSS BUSINESS VOLUME TO EMPLOYMENT (PRODUCTIVITY) RATIOS, BY ECONOMIC SECTOR, WYOMING REGION 6, 1960-1980, (1980 = BASE DOLLARS) (CONTINUED)

	Sector								
Year	(12) Trans	(13) Comm & Pub Util	(14) Elec Gen	(15) Retail Trade	(16) FIRE	(17) Bus & Pers Service	(18) Prof & Soc Serv	(19) Govt	(20) Households
1960	15,079	55,044	--	66,827	81,758	22,826	30,442	6,723	--
1961	14,026	50,569	--	61,046	73,843	21,372	27,354	6,548	--
1962	12,795	46,154	--	55,760	66,667	19,927	24,862	6,262	--
1963	15,029	50,746	--	68,673	89,006	20,774	29,666	7,566	--
1964	16,026	45,768	--	67,257	73,814	21,869	26,639	7,339	--
1965	15,304	43,375	--	61,701	62,665	20,690	21,926	7,526	--
1966	13,958	45,049	--	61,513	72,451	23,895	23,923	8,094	--
1967	15,304	48,641	--	69,092	77,115	25,232	23,495	8,132	--
1968	13,504	52,262	--	70,796	76,208	25,194	23,026	8,222	--
1969	12,224	55,161	--	70,715	71,826	25,211	21,842	8,315	--
1970	15,213	60,345	--	73,405	74,953	26,842	22,160	8,062	--
1971	15,368	59,239	--	74,409	72,603	26,910	22,644	7,963	--
1972	15,056	63,077	--	74,796	69,404	27,674	21,194	8,780	--
1973	16,309	69,613	--	84,175	87,734	29,344	24,254	10,073	--
1974	18,164	80,897	--	93,217	86,949	31,546	26,008	10,839	--
1975	17,486	76,087	--	80,682	83,575	27,846	25,826	10,116	--
1976	16,870	60,114	--	78,265	72,689	25,055	22,175	9,707	--
1977	17,103	50,640	--	65,487	62,486	21,091	20,579	9,425	--
1978	15,606	60,000	--	69,420	69,095	20,766	19,838	9,925	--
1979	17,834	67,886	--	76,735	70,516	18,354	20,064	11,153	--
1980	27,083	82,767	--	91,150	77,386	25,371	25,369	13,098	--

APPENDIX TABLE 37. GROSS BUSINESS VOLUME TO EMPLOYMENT (PRODUCTIVITY) RATIOS, BY ECONOMIC SECTOR, WYOMING, 1960-1980, (1980 = BASE DOLLARS)

	Sector									
Year	(1) & (2) Agric	(3) Metal Mining	(4) Coal Mining	(5) Pet/NG Exp/Ext	(6) Nonmetallic Mining	(7) Constr	(8) Lumber	(9) Ag Proc & Misc Mfg	(10) Pet Refining	(11) Metal Proc
1960	95,335	18,382	36,162	161,433	18,419	33,527	16,187	52,920	77,207	35,697
1961	89,367	20,486	38,562	156,236	16,493	31,521	15,061	48,461	76,402	34,899
1962	95,151	18,295	35,103	145,487	17,643	30,801	14,217	48,113	82,877	29,278
1963	97,756	18,886	39,604	121,338	20,921	37,510	14,074	47,317	93,664	25,724
1964	94,092	14,024	36,986	110,893	24,598	36,328	13,815	44,816	113,765	19,048
1965	99,111	15,771	44,231	123,791	27,738	43,137	13,111	47,440	105,033	14,558
1966	112,600	13,277	36,929	130,776	25,283	44,404	17,662	49,726	103,314	15,126
1967	107,245	14,222	41,404	132,043	24,372	46,460	21,065	51,084	113,153	17,123
1968	115,214	13,810	38,636	114,170	21,072	47,659	25,415	49,150	120,930	17,538
1969	117,877	13,902	45,275	117,753	23,271	47,529	29,115	47,574	147,651	19,185
1970	115,786	18,522	46,246	119,230	27,131	46,907	18,406	47,370	155,433	18,382
1971	123,102	18,621	43,106	135,899	23,237	43,757	27,279	46,843	162,661	22,188
1972	147,783	32,625	65,062	122,913	25,243	41,756	31,218	61,640	157,841	26,391
1973	180,083	24,045	121,841	134,901	31,345	36,235	37,845	66,361	205,601	31,450
1974	147,792	15,129	64,484	182,123	24,561	41,896	24,356	51,399	379,812	40,987
1975	143,119	11,721	93,055	154,628	26,625	50,479	22,939	49,529	771,792	36,333
1976	146,569	19,408	118,401	165,593	30,462	37,504	25,121	54,109	431,132	37,079
1977	159,585	22,007	103,611	301,105	24,713	35,238	25,044	50,394	513,498	31,325
1978	174,820	18,152	93,918	244,649	28,307	30,566	23,365	52,068	521,079	27,843
1979	199,408	13,733	90,626	279,699	35,438	31,790	24,423	51,813	639,410	23,068
1980	175,887	13,840	93,531	350,402	34,259	41,466	20,621	48,318	910,069	25,192

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APPENDIX TABLE 37. GROSS BUSINESS VOLUME TO EMPLOYMENT (PRODUCTIVITY) RATIOS, BY ECONOMIC SECTOR, WYOMING, 1960-1980, (1980 = BASE DOLLARS) (CONTINUED)

	Sector								
Year	(12) Trans	(13) Comm & Pub Util	(14) Elec Gen	(15) Retail Trade	(16) FIRE	(17) Bus & Pers Service	(18) Prof & Soc Serv	(19) Govt	(20) Households
1960	8,372	36,869	30,348	55,689	54,152	19,563	21,816	4,874	--
1961	8,169	35,092	32,497	53,103	51,976	19,478	20,464	4,562	--
1962	8,121	35,270	29,810	53,541	53,289	20,016	20,640	4,572	--
1963	9,866	44,929	44,906	62,623	65,137	22,554	25,761	5,538	--
1964	10,935	37,522	53,435	57,926	58,415	22,750	23,224	4,992	--
1965	11,438	38,491	46,496	58,004	56,968	22,146	19,593	4,936	--
1966	10,568	39,821	53,809	60,982	60,971	23,843	19,817	5,232	--
1967	10,925	41,811	55,071	65,305	61,048	25,790	19,968	5,492	--
1968	9,953	46,296	55,533	68,260	62,560	26,393	20,011	5,478	--
1969	9,743	50,593	66,020	70,383	62,361	26,790	19,720	5,728	--
1970	11,249	49,462	71,212	71,676	61,900	27,801	19,585	5,791	--
1971	11,545	48,879	65,176	71,781	65,343	26,882	18,945	5,509	--
1972	13,168	58,515	94,903	83,431	74,226	31,739	21,301	6,364	--
1973	14,316	67,644	138,740	93,738	92,718	32,604	25,358	7,758	--
1974	16,003	76,957	193,103	76,483	73,875	28,169	20,503	6,979	--
1975	14,747	70,586	228,430	71,882	67,533	25,415	20,946	7,019	--
1976	14,705	56,863	159,905	69,501	64,795	24,677	19,859	7,065	--
1977	16,070	50,488	158,802	70,067	62,527	21,956	20,306	7,637	--
1978	14,672	59,707	172,978	66,822	64,052	21,456	19,438	7,957	--
1979	15,622	63,079	210,707	71,047	65,293	19,638	20,787	8,789	--
1980	20,503	69,902	175,556	78,099	66,969	21,931	20,372	9,248	--

APPENDIX TABLE 38. REGRESSION EQUATIONS[a] FOR PROJECTION OF GROSS BUSINESS VOLUME TO EMPLOYMENT (PRODUCTIVITY) RATIOS FOR 20-SECTOR WYOMING I-O MODEL, WYOMING REGION 2, (1980 = BASE DOLLARS) THOUSAND DOLLARS

Sector	
(1) & (2) Agriculture	Y = 14,148.58 + 7.30(X)
(3) Metal Mining	Y = -225.14 + 0.12(X)
(4) Coal Mining	Y = 126.000[b]
(5) Pet/NG Exp/Ext	Y = -9,063.67 + 4.65(X)
(6) Nonmetallic Mining	Y = 16.463[c]
(7) Construction	Y = -253.49 + 0.143(X)
(8) Lumber	Y = -558.47 + 0.29(X)
(9) Ag Proc and Misc Manufacturing	Y = 653.70 - 0.31(X)
(10) Pet Refining	Y = -45,401.41 + 23.29(X)
(11) Metal Processing	Y = 10,000[d]
(12) Transportation	Y = -680.51 + 0.352(X)
(13) Comm & Public Utilities	Y = -2,028.56 + 1.051(X)
(14) Electric Generation	Y = -15,948.47 + 8.15(X)
(15) Retail	Y = -808.75 + 0.44(X)
(16) Fin, Ins, Real Estate	Y = -590.06 + 0.32(X)
(17) Business & Pers Service	Y = -32.46 + 0.025(X)
(18) Prof & Soc Service	Y = 14.750
(19) Government	Y = -444.74 + 0.23(X)
(20) Households	Y = 10,000[d]

[a]Robust regression with intercept adjustment technique.
[b]The 1981 projected productivity ratio was used for the projection period.
[c]The 1980 productivity ratio was used for the projection period.
[d]Because very little or no employment exists in this sector for Region 2, arbitrary, very large numbers were utilized in developing projections of baseline employment.

APPENDIX TABLE 39. REGRESSION EQUATIONS[a] FOR PROJECTION OF GROSS BUSINESS VOLUME TO EMPLOYMENT (PRODUCTIVITY) RATIOS FOR 20-SECTOR WYOMING I-O MODEL, WYOMING REGION 3, (1980 = BASE DOLLARS) THOUSAND DOLLARS

Sector		
(1) & (2) Agriculture	Y = -8,702.63	+ 4.50(X)
(3) Metal Mining	Y = -311.05	+ 0.17(X)
(4) Coal Mining	Y = -6,450.38	+ 3.31(X)
(5) Pet/NG Exp/Ext	Y = 2,188.27	- 0.38(X)
(6) Nonmetallic Mining	Y = -1,858.20	+ 0.972(X)
(7) Construction	Y = -1,382.38	+ 0.722(X)
(8) Lumber	Y = -1,151.15	+ 0.59(X)
(9) Ag Proc and Misc Manufacturing	Y = -1,203.19	+ 0.64(X)
(10) Pet Refining	Y = -116,702.90	+ 59.63(X)
(11) Metal Processing	Y = -415.27	+ 0.2205(X)
(12) Transportation	Y = -797.02	+ 0.41(X)
(13) Comm & Public Utilities	Y = -2,669.15	+ 1.3808(X)
(14) Electric Generation	Y = 117.606[b]	
(15) Retail	Y = -2,698.00	+ 1.40(X)
(16) Fin, Ins, Real Estate	Y = -633.27	+ 0.35(X)
(17) Business & Pers Service	Y = -395.89	+ 0.21(X)
(18) Prof & Soc Service	Y = -98.34	+ 0.063(X)
(19) Government	Y = -251.73	+ 0.13(X)
(20) Households	Y = 10,000[c]	

[a]Robust regression with intercept adjustment technique.
[b]The 1980 productivity ratio was used for the projection period.
[c]Because very little or no employment exists in this sector for Region 3, arbitrary, very large numbers were utilized in developing projections of baseline employment.

APPENDIX TABLE 40. REGRESSION EQUATIONS[a] FOR PROJECTION OF GROSS BUSINESS VOLUME TO EMPLOYMENT (PRODUCTIVITY) RATIOS FOR 20-SECTOR WYOMING I-O MODEL, WYOMING REGION 4, (1980 = BASE DOLLARS) THOUSAND DOLLARS

Sector	
(1) & (2) Agriculture	Y = -8,939.83 + 4.613(X)
(3) Metal Mining	Y = 10,000[b]
(4) Coal Mining	Y = -9,187.09 + 4.69(X)
(5) Pet/NG Exp/Ext	Y = -24,031.31 + 12.38(X)
(6) Nonmetallic Mining	Y = -2,341.95 + 1.20(X)
(7) Construction	Y = -1,667.34 + 0.871(X)
(8) Lumber	Y = 25.600[c]
(9) Ag Proc and Misc Manufacturing	Y = -3,591.98 + 1.85(X)
(10) Pet Refining	Y = -8,928.25 + 4.57(X)
(11) Metal Processing	Y = 10,000[b]
(12) Transportation	Y = -613.63 + 0.324(X)
(13) Comm & Public Utilities	Y = -5,241.62 + 2.69(X)
(14) Electric Generation	Y = -21,006.32 + 10.72(X)
(15) Retail	Y = -2,189.04 + 1.15(X)
(16) Fin, Ins, Real Estate	Y = -4,296.10 + 2.23(X)
(17) Business & Pers Service	Y = -778.78 + 0.41(X)
(18) Prof & Soc Service	Y = -822.14 + 0.43(X)
(19) Government	Y = -934.30 + 0.4815(X)
(20) Households	Y = 10,000[b]

[a]Robust regression with intercept adjustment technique.
[b]Because very little or no employment exists in this sector for Region 4, arbitrary, very large numbers were utilized in developing projections of baseline employment.
[c]The 1981 projected productivity ratio was used for the projection period.

APPENDIX TABLE 41. REGRESSION EQUATIONS[a] FOR PROJECTION OF GROSS BUSINESS VOLUME TO EMPLOYMENT (PRODUCTIVITY) RATIOS FOR 20-SECTOR WYOMING I-O MODEL, WYOMING REGION 5, (1980 = BASE DOLLARS) THOUSAND DOLLARS

Sector	
(1) & (2) Agriculture	Y = -6,307.47 + 3.25(X)
(3) Metal Mining	Y = 10.673[b]
(4) Coal Mining	Y = 10,000[c]
(5) Pet/NG Exp/Ext	Y = -23,520.08 + 12.09(X)
(6) Nonmetallic Mining	Y = -377.66 + 0.26(X)
(7) Construction	Y = 26.690[d]
(8) Lumber	Y = -6,501.88 + 3.331(X)
(9) Ag Proc and Misc Manufacturing	Y = 43.740[d]
(10) Pet Refining	Y = 10,000[c]
(11) Metal Processing	Y = -310.04 + 0.175(X)
(12) Transportation	Y = 275.42 - 0.13(X)
(13) Comm & Public Utilities	Y = 299.59 - 0.12(X)
(14) Electric Generation	Y = 10,000[c]
(15) Retail	Y = 891.70 - 0.42(X)
(16) Fin, Ins, Real Estate	Y = 62.850[d]
(17) Business & Pers Service	Y = 20.016[b]
(18) Prof & Soc Service	Y = 10.635[b]
(19) Government	Y = -110.93 + 0.061(X)
(20) Households	Y = 10,000[c]

[a]Robust regression with intercept adjustment technique.
[b]The 1980 productivity ratio was used for the projection period.
[c]Because very little or no employment exists in this sector for Region 5, arbitrary, very large numbers were utilized in developing projections of baseline employment.
[d]The 1981 projected productivity ratio was used for the projection period.

APPENDIX TABLE 42. REGRESSION EQUATIONS[a] FOR PROJECTION OF GROSS BUSINESS VOLUME TO EMPLOYMENT (PRODUCTIVITY) RATIOS FOR 20-SECTOR WYOMING I-O MODEL, WYOMING REGION 6, (1980 = BASE DOLLARS) THOUSAND DOLLARS

Sector	
(1) & (2) Agriculture	Y = -8,756.20 + 4.51(X)
(3) Metal Mining	Y = 10,000[b]
(4) Coal Mining	Y = -4,872.84 + 2.49(X)
(5) Pet/NG Exp/Ext	Y = 735.064[c]
(6) Nonmetallic Mining	Y = -1,277.57 + 0.66(X)
(7) Construction	Y = 894.34 - 0.43(X)
(8) Lumber	Y = -701.41 + 0.36(X)
(9) Ag Proc and Misc Manufacturing	Y = 33.265[c]
(10) Pet Refining	Y = -18,201.25 + 9.34(X)
(11) Metal Processing	Y = 10,000[b]
(12) Transportation	Y = -316.59 + 0.173(X)
(13) Comm & Public Utilities	Y = -2,560.52 + 1.33(X)
(14) Electric Generation	Y = 10,000[b]
(15) Retail	Y = -2,037.36 + 1.07(X)
(16) Fin, Ins, Real Estate	Y = 270.13 - 0.10(X)
(17) Business & Pers Service	Y = -334.54 + 0.1816(X)
(18) Prof & Soc Service	Y = 24.500[d]
(19) Government	Y = -423.77 + 0.22(X)
(20) Households	Y = 10,000[b]

[a]Robust regression with intercept adjustment technique.
[b]Because very little or no employment exists in this sector for Region 6, arbitrary, very large numbers were utilized in developing projections of baseline employment.
[c]The 1980 productivity ratio was used for the projection period.
[d]The 1981 projected productivity ratio was used for the projection period.

APPENDIX TABLE 43. REGRESSION EQUATIONS[a] FOR PROJECTION OF GROSS BUSINESS VOLUME TO EMPLOYMENT (PRODUCTIVITY) RATIOS FOR 20-SECTOR WYOMING I-O MODEL, WYOMING, (1980 = BASE DOLLARS) THOUSAND DOLLARS

Sector	
(1) & (2) Agriculture	Y = -8,618.72 + 4.45(X)
(3) Metal Mining	Y = 133.92 - 0.06(X)
(4) Coal Mining	Y = -7,225.90 + 3.70(X)
(5) Pet/NG Exp/Ext	Y = -12,604.97 + 6.52(X)
(6) Nonmetallic Mining	Y = -1,272.81 + 0.66(X)
(7) Construction	Y = -103.85 + 0.07(X)
(8) Lumber	Y = -1,104.66 + 0.57(X)
(9) Ag Proc and Misc Manufacturing	Y = -285.53 + 0.17(X)
(10) Pet Refining	Y = -51,509.23 + 26.39(X)
(11) Metal Processing	Y = -488.91 + 0.26(X)
(12) Transportation	Y = -813.83 + 0.42(X)
(13) Comm & Public Utilities	Y = -3,021.45 + 1.56(X)
(14) Electric Generation	Y = -17,259.54 + 8.82(X)
(15) Retail	Y = -1,925.79 + 1.01(X)
(16) Fin, Ins, Real Estate	Y = -1,121.36 + 0.60(X)
(17) Business & Pers Service	Y = -255.91 + 0.14(X)
(18) Prof & Soc Service	Y = 59.76 - 0.02(X)
(19) Government	Y = -367.16 + 0.19(X)
(20) Households	Y = 10,000[b]

[a]Robust regression with intercept adjustment technique.
[b]Because very little or no employment exists in this sector for Wyoming, arbitrary, very large numbers were utilized in developing projections of baseline employment.

APPENDIX TABLE 44. PROJECTED GROSS BUSINESS VOLUME TO EMPLOYMENT (PRODUCTIVITY) RATIOS FOR WYOMING REGION 2, 1981, 1985, 1990, 1995, 2000, AND 2005 (1980 = BASE DOLLARS)

Sector	1981	1985	1990	1995	2000	2005
(1) & (2) Agriculture	305,420	334,620	371,120	407,620	444,120	480,620
(3) Metal Mining	12,460	12,940	13,540	14,140	14,740	15,340
(4) Coal Mining	126,000	126,000	126,000	126,000	126,000	126,000
(5) Pet/NG Exp/Ext	143,330	161,930	185,180	208,430	231,680	254,930
(6) Nonmetallic Mining	16,463	16,463	16,463	16,463	16,463	16,463
(7) Construction	29,650	30,222	30,937	31,652	32,367	33,082
(8) Lumber	15,730	16,890	18,340	19,790	21,240	22,690
(9) Ag Proc and Misc Mfg	39,900	38,660	37,110	35,560	34,010	32,460
(10) Pet Refining	712,790	805,950	922,400	1,038,850	1,155,300	1,271,750
(11) Metal Processing	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000
(12) Transportation	16,450	17,858	19,618	21,378	23,138	24,898
(13) Comm & Public Util	52,420	56,624	61,879	67,134	72,389	77,644
(14) Electric Generation	188,530	221.130	261,880	302,630	343,380	384,130
(15) Retail	62,450	64,210	66,410	68,610	70,810	73,010
(16) Fin, Ins, Real Estate	43,540	44,820	46,420	48,020	49,620	51,220
(17) Business & Pers Serv	17,040	17,140	17,256	17,390	17,515	17,640
(18) Prof & Soc Serv	14,750	14,750	14,750	14,750	14,750	14,750
(19) Government	10,660	11,580	12,730	13,880	15,030	16,180
(20) Households	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000

APPENDIX TABLE 45. PROJECTED GROSS BUSINESS VOLUME TO EMPLOYMENT (PRODUCTIVITY) RATIOS FOR WYOMING REGION 3, 1981, 1985, 1990, 1995, 2000, AND 2005 (1980 = BASE DOLLARS)

Sector	1981	1985	1990	1995	2000	2005
(1) & (2) Agriculture	207,370	225,370	247,870	270,370	292,870	315,370
(3) Metal Mining	25,550	26,230	27,080	27,930	28,780	29,630
(4) Coal Mining	103,420	116,660	133,210	149,760	166,310	182,860
(5) Pet/NG Exp/Ext	1,435,870	1,434,350	1,432,450	1,430,550	1,428,650	1,426,750
(6) Nonmetallic Mining	66,360	70,248	75,108	79,968	84,828	89,688
(7) Construction	47,180	50,068	53,678	57,288	60,898	64,508
(8) Lumber	17,050	19,410	22,360	25,310	28,260	31,210
(9) Ag Proc and Misc Mfg	64,010	66,570	69,770	72,970	76,170	79,370
(10) Pet Refining	1,364,500	1,603,020	1,901,170	2,199,320	2,497,470	2,795,620
(11) Metal Processing	21,320	22,202	23,305	24,407	25,510	26,612
(12) Transportation	14,780	16,420	18,470	20,520	22,570	24,620
(13) Comm & Public Util	64,834	70,357	77,261	84,165	91,069	97,973
(14) Electric Generation	117,606	117,606	117,606	117,606	117,606	117,606
(15) Retail	74,000	79,600	86,600	93,600	100,600	107,600
(16) Fin, Ins, Real Estate	59,730	61,130	62,880	64,630	66,380	68,130
(17) Business & Pers Serv	19,910	20,750	21,800	22,850	23,900	24,950
(18) Prof & Soc Serv	26,400	26,652	26,967	27,282	27,597	27,912
(19) Government	5,670	6,190	6,840	7,490	8,140	8,790
(20) Households	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000

APPENDIX TABLE 46. PROJECTED GROSS BUSINESS VOLUME TO EMPLOYMENT (PRODUCTIVITY) RATIOS FOR WYOMING REGION 4, 1981, 1985, 1990, 1995, 2000, AND 2005 (1980 = BASE DOLLARS)

Sector	1981	1985	1990	1995	2000	2005
(1) & (2) Agriculture	193,910	212,362	235,427	258,492	281,557	304,622
(3) Metal Mining	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000
(4) Coal Mining	99,110	117,870	141,320	164,770	188,220	211,670
(5) Pet/NG Exp/Ext	481,090	530,610	592,510	654,410	716,310	778,210
(6) Nonmetallic Mining	34,050	38,850	44,850	50,850	56,850	62,850
(7) Construction	57,240	60,724	65,079	69,434	73,789	78,144
(8) Lumber	25,600	25,600	25,600	25,600	25,600	25,600
(9) Ag Proc and Misc Mfg	71,020	78,420	87,670	96,920	106,170	115,420
(10) Pet Refining	120,350	138,630	161,480	184,330	207,180	230,030
(11) Metal Processing	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000
(12) Transportation	27,890	29,186	30,806	32,426	34,046	35,666
(13) Comm & Public Util	84,580	95,340	108,790	122,240	135,690	149,140
(14) Electric Generation	219,280	262,160	315,760	369,360	422,960	476,560
(15) Retail	87,960	92,560	98,310	104,060	109,810	115,560
(16) Fin, Ins, Real Estate	119,300	128,220	139,370	150,520	161,670	172,820
(17) Business & Pers Serv	33,020	34,660	36,710	38,760	40,810	42,860
(18) Prof & Soc Serv	29,260	30,980	33,130	35,280	37,430	39,580
(19) Government	19,070	20,996	23,404	25,811	28,219	30,626
(20) Households	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000

APPENDIX TABLE 47. PROJECTED GROSS BUSINESS VOLUME TO EMPLOYMENT (PRODUCTIVITY) RATIOS FOR WYOMING REGION 5, 1981, 1985, 1990, 1995, 2000, AND 2005 (1980 = BASE DOLLARS)

Sector	1981	1985	1990	1995	2000	2005
(1) & (2) Agriculture	127,530	140,530	156,780	173,030	189,280	205,530
(3) Metal Mining	10,673	10,673	10,673	10,673	10,673	10,673
(4) Coal Mining	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000
(5) Pet/NG Exp/Ext	418,120	466,480	526,930	587,380	647,830	708,280
(6) Nonmetallic Mining	137,140	138,180	139,480	140,780	142,080	143,380
(7) Construction	26,690	26,690	26,690	26,690	26,690	26,690
(8) Lumber	93,500	106,824	123,479	140,134	156,789	173,444
(9) Ag Proc and Misc Mfg	43,740	43,740	43,740	43,740	43,740	43,740
(10) Pet Refining	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000
(11) Metal Processing	36,460	37,160	38,035	38,910	39,785	40,660
(12) Transportation	18,020	17,500	16,850	16,200	15,550	14,900
(13) Comm & Public Util	61,990	61,510	60,910	60,310	59,710	59,110
(14) Electric Generation	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000
(15) Retail	60,100	58,420	56,320	54,220	52,120	50,020
(16) Fin, Ins, Real Estate	62,850	62,850	62,850	62,850	62,850	62,850
(17) Business & Pers Serv	20,016	20,016	20,016	20,016	20,016	20,016
(18) Prof & Soc Serv	10,635	10,635	10,635	10,635	10,635	10,635
(19) Government	9,850	10,094	10,399	10,704	11,009	11,314
(20) Households	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000

APPENDIX TABLE 48. PROJECTED GROSS BUSINESS VOLUME TO EMPLOYMENT (PRODUCTIVITY) RATIOS FOR WYOMING REGION 6, 1981, 1985, 1990, 1995, 2000, AND 2005 (1980 = BASE DOLLARS)

Sector	1981	1985	1990	1995	2000	2005
(1) & (2) Agriculture	173,600	191,640	214,190	236,740	259,290	281,840
(3) Metal Mining	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000
(4) Coal Mining	57,360	67,320	79,770	92,220	104,670	117,120
(5) Pet/NG Exp/Ext	735,064	735,064	735,064	735,064	735,064	735,064
(6) Nonmetallic Mining	29,230	31,870	35,170	38,470	41,770	45,070
(7) Construction	42,940	41,220	39,070	36,920	34,770	32,620
(8) Lumber	11,390	12,830	14,630	16,430	18,230	20,030
(9) Ag Proc and Misc Mfg	33,265	33,265	33,265	33,265	33,265	33,265
(10) Pet Refining	291,950	329,310	376,010	422,710	469,410	516,110
(11) Metal Processing	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000
(12) Transportation	25,950	26,642	27,507	28,372	29,237	30,102
(13) Comm & Public Util	72,880	78,200	84,850	91,500	98,150	104,800
(14) Electric Generation	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000
(15) Retail	81,240	85,520	90,870	96,220	101,570	106,920
(16) Fin, Ins, Real Estate	72,130	71,730	71,230	70,730	70,230	69,730
(17) Business & Pers Serv	25,028	25,754	26,662	27,570	28,478	29,386
(18) Prof & Soc Serv	24,500	24,500	24,500	24,500	24,500	24,500
(19) Government	11,830	12,710	13,810	14,910	16,010	17,110
(20) Households	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000

APPENDIX TABLE 49. PROJECTED GROSS BUSINESS VOLUME TO EMPLOYMENT (PRODUCTIVITY) RATIOS FOR WYOMING 1981, 1985, 1990, 1995, 2000, AND 2005 (1980 = BASE DOLLARS)

Sector	1981	1985	1990	1995	2000	2005
(1) & (2) Agriculture	192,280	210,080	232,330	254,580	276,830	299,080
(3) Metal Mining	15,120	14,880	14,580	14,280	13,980	13,680
(4) Coal Mining	100,100	114,900	133,400	151,900	170,400	188,900
(5) Pet/NG Exp/Ext	304,630	330,710	363,310	395,910	428,510	461,110
(6) Nonmetallic Mining	33,990	36,630	39,930	43,230	46,530	49,830
(7) Construction	34,750	35,030	35,380	35,730	36,080	36,430
(8) Lumber	23,940	26,220	29,070	31,920	34,770	37,620
(9) Ag Proc and Misc Mfg	51,070	51,750	52,600	53,450	54,300	55,150
(10) Pet Refining	742,970	848,530	980,480	1,112,430	1,244,380	1,376,330
(11) Metal Processing	25,890	26,930	28,230	29,530	30,830	32,130
(12) Transportation	17,770	19,450	21,550	23,650	25,750	27,850
(13) Comm & Public Util	67,350	73,590	81,390	89,190	96,990	104,790
(14) Electric Generation	204,060	239,340	283,440	327,540	371,640	415,740
(15) Retail	74,010	78,050	83,100	88,150	93,200	98,250
(16) Fin, Ins, Real Estate	66,640	69,040	72,040	75,040	78,040	81,040
(17) Business & Pers Serv	21,290	21,850	22,550	23,250	23,950	24,650
(18) Prof & Soc Serv	20,160	20,080	19,980	19,880	19,780	19,680
(19) Government	9,040	9,800	10,750	11,700	12,650	13,600
(20) Households	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000

APPENDIX TABLE 50. PROJECTED CITY SHARE OF REGIONAL EMPLOYMENT BY CITY AND COUNTY, WYOMING REGION 2, 1980, 1985, 1990, 1995, AND 2000

County	City	1980	ADJ 1980	1985	ADJ 1985	1990	ADJ 1990	1995	ADJ 1995	2000	ADJ 2000
Converse	Douglas	0.0889963		0.0990417		0.1102204		0.1226608		0.1365054	
			0.0889975		0.0950622		0.1001664		0.1041861		0.107024
	Glenrock	0.0403801		0.0426099		0.0449627		0.0474455		0.0500655	
			0.0403805		0.0408978		0.0408614		0.0402995		0.039253
Natrona	Alcova	0.0029516		0.0032311		0.0035367		0.0038714		0.0042376	
			0.0029518		0.0031012		0.0032141		0.0032883		0.003322
	Casper	0.7529486		0.7415229		0.7302712		0.7191902		0.7082774	
	Edgerton	0.0075271		0.0069216		0.0063648		0.0058528		0.0053820	
	Evansville	0.0391406		0.0506660		0.0655850		0.0848973		0.1098962	
			0.0391410		0.0486302		0.0595025		0.0721104		0.086161
	Midwest	0.0094163		0.0095714		0.0097290		0.0098893		0.0100522	
			0.0094164		0.0091868		0.0088416		0.0083998		0.007881
	Mills	0.0315697		0.0318769		0.0321874		0.0325010		0.0328176	
			0.0315696		0.0305960		0.0292514		0.0276058		0.025730
Niobrara	Lusk	0.0243524		0.0216672		0.0192780		0.0171522		0.0152609	
	Lance Creek	0.0013283		0.0012227		0.0011254		0.0010359		0.0009535	
	Manville	0.0013874		0.0011916		0.0010234		0.0008790		0.0007549	
SUM OF DECLINING COUNTIES		0.7875431		0.7725258		0.7580627		0.7441101		0.7306286	
ONE MINUS DECLINING COUNTIES		0.2124569		0.2274742		0.2419373		0.2558899		0.2693714	
SUM OF INCREASING COUNTIES		0.2124547		0.2369967		0.2662213		0.3012652		0.3435743	
ADJUSTED TOTAL			0.9999998		0.9999999		0.9999999		0.9999999		1.000000

APPENDIX TABLE 51. PROJECTED CITY SHARE OF REGIONAL EMPLOYMENT BY CITY AND COUNTY, WYOMING REGION 3, 1980, 1985, 1990, 1995, AND 2000

County	City	1980	ADJ 1980	1985	ADJ 1985	1990	ADJ 1990	1995	ADJ 1995	2000	ADJ 2000
Albany	Laramie	0.2327765		0.2398179		0.2470724		0.2545464		0.2622462	
			0.2327787		0.2363917		0.2385493		0.2390937		0.23786
	Rock River	0.0039575		0.0035874		0.0032519		0.0029478		0.0026721	
Carbon	Baggs	0.0041291		0.0041565		0.0054769		0.0059079		0.0072647	
			0.0041291		0.0046876		0.0052880		0.0059249		0.00658
	Dixon	0.0007820		0.0006922		0.0006127		0.0005424		0.0004801	
	Elk Mountain	0.0032232		0.0035298		0.0038657		0.0042335		0.0046363	
			0.0032232		0.0034794		0.0037323		0.0039765		0.00420
	Encampment	0.0058265		0.0064305		0.0070970		0.0078326		0.0086445	
			0.0058266		0.0063386		0.0068522		0.0073571		0.00784
	Hanna	0.0218186		0.0286190		0.0375390		0.0492392		0.0645860	
			0.0218188		0.0282102		0.0362441		0.0462501		0.05858
	Medicine Bow	0.0090879		0.0107609		0.0127418		0.0150875		0.0178650	
			0.0090879		0.0106071		0.0123023		0.0141716		0.01620
	Rawlins	0.1101130		0.1112283		0.1123549		0.1134930		0.1146426	
			0.1101140		0.1096392		0.1084791		0.1066031		0.10398
	Riverside	0.0005245		0.0004435		0.0003750		0.0003171		0.0002681	
	Saratoga	0.0229820		0.0263189		0.0301404		0.0345167		0.0395285	
			0.0229822		0.0259429		0.0291006		0.0324213		0.03585
	Sinclair	0.0055882		0.0052228		0.0048814		0.0045622		0.0042640	
Goshen	Fort Laramie	0.0033948		0.0035791		0.0037734		0.0039782		0.0041942	
			0.0033949		0.0035280		0.0036432		0.0037367		0.00380
	LaGrange	0.0022124		0.0022479		0.0022841		0.0023208		0.0023581	
			0.0022124		0.0022158		0.0022053		0.0021799		0.00213
	Lingle	0.0045297		0.0043859		0.0042466		0.0041118		0.0039812	
	Torrington	0.0518858		0.0525291		0.0531805		0.0538398		0.0545074	
			0.0518863		0.0517787		0.0513460		0.0505714		0.04944
	Yoder	0.0010490		0.0010673		0.0010859		0.0011048		0.0011241	
			0.0010490		0.0010520		0.0010484		0.0010378		0.00102
Laramie	Albin	0.0012206		0.0010751		0.0009469		0.0008340		0.0007345	
	Burns	0.0025557		0.0025318		0.0025082		0.0024847		0.0024615	
	Carpenter	0.0004768		0.0004521		0.0004288		0.0004066		0.0003856	
	Cheyenne	0.4507168		0.4363512		0.4224434		0.4089790		0.3959437	
	Federal	0.0000954		0.0000904		0.0000858		0.0000813		0.0000771	
	Horse Creek	0.0001430		0.0001356		0.0001286		0.0001220		0.0001157	
	Pine Bluffs	0.0102704		0.0096422		0.0090524		0.0084987		0.0079788	
Platte	Chugwater	0.0026892		0.0025389		0.0023970		0.0022631		0.0021366	
	Glendo	0.0034997		0.0035139		0.0035281		0.0035424		0.0035567	
			0.0034998		0.0034637		0.0034064		0.0033273		0.00322
	Guernsey	0.0144184		0.0160312		0.0178244		0.0198181		0.0220349	
			0.0144186		0.0156022		0.0172095		0.0186150		0.01998
	Hartville	0.0014209		0.0012906		0.0011723		0.0010648		0.0009672	
	Wheatland	0.0286080		0.0288359		0.0290656		0.0292972		0.0295306	
			0.0286083		0.0284239		0.0280630		0.0275186		0.02678
SUM OF DECLINING COUNTIES		0.4849705		0.4684395		0.4525207		0.4372151		0.4224660	
ONE MINUS DECLINING COUNTIES		0.5150295		0.5315605		0.5474693		0.5627849		0.5775340	
SUM OF INCREASING COUNTIES		0.5150244		0.5392649		0.5670298		0.5991578		0.6367195	
ADJUSTED TOTAL			0.9999995		0.9999997		0.9999997		0.9999998		1.00000

APPENDIX TABLE 52. PROJECTED CITY SHARE OF REGIONAL EMPLOYMENT BY CITY AND COUNTY, WYOMING REGION 4, 1980, 1985, 1990, 1995, AND 2000

County	City	1980	ADJ 1980	1985	ADJ 1985	1990	ADJ 1990	1995	ADJ 1995	2000	ADJ 2000
Lincoln	Afton	0.0284523		0.0250280		0.0220158		0.0193661		0.0170353	
	Cokeville	0.0098939		0.0083642		0.0070710		0.0059777		0.0050535	
	Diamondville	0.0192115		0.0207393		0.0223885		0.0241689		0.0260908	
			0.0192117		0.0196636		0.0198144		0.0196802		0.019284
	Kemmerer	0.0628793		0.0607687		0.0587289		0.0567575		0.0548523	
	LaBarge	0.0058018		0.0058218		0.0058419		0.0058620		0.0058822	
			0.0058018		0.0055198		0.0051702		0.0047733		0.004348
	Thayne	0.0049182		0.0044102		0.0039548		0.0035463		0.0031801	
Sublette	Big Piney	0.0101821		0.0082553		0.0066931		0.0054265		0.0043996	
	Marbleton	0.0103164		0.0114844		0.0127846		0.0142320		0.0158433	
			0.0103165		0.0108888		0.0113147		0.0115889		0.011710
	Pinedale	0.0204795		0.0180024		0.0158248		0.0139107		0.0122281	
Sweetwater	Eden	0.0009606		0.0008236		0.0007062		0.0006055		0.0005192	
	Granger	0.0034004		0.0029949		0.0026377		0.0023231		0.0020461	
	Green River	0.2460417		0.2918428		0.3461695		0.4106091		0.4870445	
			0.2460433		0.2767058		0.3063688		0.3343508		0.359973
	Rock Springs	0.3738155		0.3751267		0.3764426		0.3777636		0.3790886	
			0.3738179		0.3556701		0.3331612		0.3076054		0.280183
	South Superior	0.0112580		0.0106133		0.0100056		0.0094326		0.0088925	
	Wamsutter	0.0130830		0.0176949		0.0239326		0.0323690		0.0437794	
			0.0130831		0.0167771		0.0211809		0.0263574		0.032357
Uinta	Evanston	0.1233572		0.1131609		0.1038074		0.0952269		0.0873558	
	Lyman	0.0438791		0.0572845		0.0747852		0.0976326		0.1274600	
			0.0438794		0.0543133		0.0661868		0.0795003		0.094205
	Mountain View	0.0120648		0.0080402		0.0053582		0.0035708		0.0023796	
SUM OF DECLINING COUNTIES		0.2878461		0.2604614		0.2368030		0.2161435		0.1979418	
ONE MINUS DECLINING COUNTIES		0.7121539		0.7395386		0.7631970		0.7838565		0.8020582	
SUM OF INCREASING COUNTIES		0.7121489		0.7799943		0.8623448		0.9626373		1.0851879	
ADJUSTED TOTAL			0.9999997		0.9999999		0.9999998		0.9999998		1.000000

APPENDIX TABLE 53. PROJECTED CITY SHARE OF REGIONAL EMPLOYMENT BY CITY AND COUNTY, WYOMING REGION 5, 1980, 1985, 1990, 1995, AND 2000

County	City	1980	ADJ 1980	1985	ADJ 1985	1990	ADJ 1990	1995	ADJ 1995	2000	ADJ 2000
Fremont	Dubois	0.0398176		0.0401135		0.0404116		0.0407118		0.0410144	
			0.0398179		0.0391465		0.0382023		0.0370329		0.035681
	Hudsoner	0.0191812		0.0179789		0.0168519		0.0157956		0.0148055	
	Jeffery City	0.0307870		0.0303197		0.0298595		0.0294062		0.0289598	
	Lander	0.3405579		0.3571223		0.3744922		0.3927070		0.4118080	
			0.3405605		0.3485134		0.3540192		0.3572197		0.358262
	Pavillion	0.0107101		0.0102443		0.0097986		0.0093724		0.0089647	
	Riverton	0.3578010		0.3358404		0.3152276		0.2958800		0.2777199	
	Shoshoni	0.0328021		0.0292917		0.0261570		0.0233577		0.0208580	
Teton	Jackson	0.1683384		0.1933253		0.2220215		0.2549768		0.2928239	
			0.1683396		0.1886650		0.2098839		0.2319356		0.254749
SUM OF DECLINING COUNTIES		0.4512815		0.4236749		0.3978946		0.3738118		0.3513079	
ONE MINUS DECLINING COUNTIES		0.5487185		0.5763251		0.6021054		0.6261882		0.6486921	
SUM OF INCREASING COUNTIES		0.5487139		0.5905612		0.6369252		0.6883957		0.7456462	
ADJUSTED TOTAL			0.9999995		0.9999998		1.0000000		0.9999999		1.000000

APPENDIX TABLE 54. PROJECTED CITY SHARE OF REGIONAL EMPLOYMENT BY CITY AND COUNTY, WYOMING REGION 6, 1980, 1985, 1990, 1995, AND 2000

County	City	1980	ADJ 1980	1985	ADJ 1985	1990	ADJ 1990	1995	ADJ 1995	2000	ADJ 2000
Big Horn	Basin	0.0429604		0.0419524		0.0409680		0.0400068		0.0390681	
	Byron	0.0205584		0.0217279		0.0234196		0.0252431		0.0272086	
			0.0201585		0.0214979		0.0228510		0.0242182		0.025600
	Cowley	0.0144900		0.0140399		0.0136038		0.0131813		0.0127718	
	Deaver	0.0056686		0.0060622		0.0064831		0.0069333		0.0074147	
			0.0056686		0.0059980		0.0063257		0.0066518		0.006976
	Frannie	0.0043948		0.0040449		0.0037228		0.0034264		0.0031536	
	Greybull	0.0725135		0.0703457		0.0682427		0.0662025		0.0642233	
	Lovell	0.0779274		0.0756414		0.0734225		0.0712687		0.0691780	
	Manderson	0.0055412		0.0054364		0.0053335		0.0052326		0.0051336	
Hot Springs	East Thermopolis	0.0114325		0.0118028		0.0121850		0.0125796		0.0129870	
			0.0114326		0.0116778		0.0118891		0.0120689		0.012219
	Kirby	0.0041081		0.0044677		0.0048587		0.0052840		0.0057464	
			0.0041081		0.0044204		0.0047407		0.0050694		0.005407
	Thermopolis	0.1226711		0.1183380		0.1141579		0.1101254		0.1062354	
Park	Cody	0.2163341		0.2285449		0.2415566		0.2553092		0.2698447	
			0.2162361		0.2261254		0.2356917		0.2449432		0.253888
	Meeteetse	0.0163052		0.0158179		0.0153452		0.0148867		0.0144418	
	Powell	0.1691027		0.1689377		0.1687728		0.1686081		0.1684434	
Washakie	Ten Sleep	0.0129612		0.0134295		0.0139146		0.0144172		0.0149381	
			0.0129614		0.0132873		0.0135767		0.0138319		0.014055
	Worland	0.2035283		0.2024392		0.2013559		0.2002784		0.1992067	
SUM OF DECLINING COUNTIES		0.7294345		0.7169933		0.7049250		0.6932167		0.6818557	
ONE MINUS DECLINING COUNTIES		0.2705655		0.2830067		0.2950750		0.3067833		0.3181443	
SUM OF INCREASING COUNTIES		0.2705628		0.2860348		0.3024176		0.3197664		0.3381394	
ADJUSTED TOTAL			0.9999998		0.9999999		0.9999999		0.9999999		1.000000

APPENDIX TABLE 55. ESTIMATES OF PERSONAL INCOME AND DIFFERENCES IN ESTIMATES, WYOMING REGION 2, 1960-1980 (THOUSAND DOLLARS)

Year	Department of Commerce Estimate	I-O Analysis Estimate	Percent Difference
1960	--	116,750	--
1961	--	113,712	--
1962	170,246	122,615	-28.0
1963	--	92,570	--
1964	--	137,948	--
1965	179,796	139,918	-22.2
1966	184,515	148,688	-19.4
1967	191,819	150,851	-21.4
1968	216,134	159,652	-26.1
1969	247,606	178,259	-28.0
1970	259,247	188,177	-27.4
1971	279,732	197,516	-29.4
1972	309,334	220,649	-28.7
1973	354,107	284,568	-19.6
1974	423,743	310,721	-26.7
1975	495,306	385,648	-22.1
1976	594,163	409,499	-31.1
1977	706,616	462,868	-34.5
1978	858,536	521,618	-39.2
1979	1,028,486	655,622	-36.3
1980	1,197,214	768,139	-35.8
Average Difference			28.0

Mean = -27.994 (S.D. = 5.977)
U_1 = .205

APPENDIX TABLE 56. ESTIMATES OF PERSONAL INCOME AND DIFFERENCES IN ESTIMATES, WYOMING REGION 3, 1960-1980 (THOUSAND DOLLARS)

Year	Department of Commerce Estimate	I-O Analysis Estimate	Percent Difference
1960	--	238,836	--
1961	--	233,488	--
1962	271,014	242,253	-10.6
1963	--	330,170	--
1964	--	279,099	--
1965	307,075	264,167	-14.0
1966	316,241	288,013	- 8.9
1967	339,375	312,123	- 8.0
1968	349,561	319,323	- 8.7
1969	381,625	339,254	-11.1
1970	418,413	367,243	-12.2
1971	459,823	393,795	-14.4
1972	517,325	480,093	- 7.2
1973	599,635	744,120	24.1
1974	672,048	626,979	- 6.7
1975	727,478	703,525	- 3.3
1976	820,668	747,882	- 8.9
1977	922,752	862,517	- 6.5
1978	1,071,929	997,081	- 7.0
1979	1,268,532	1,215,485	- 4.2
1980	1,452,086	1,332,329	- 8.2
Average Difference			9.6

Mean = -6.812 (S.D. = 8.521)
U_1 = .045

APPENDIX TABLE 57. ESTIMATES OF PERSONAL INCOME AND DIFFERENCES IN ESTIMATES, WYOMING REGION 4, 1960-1980 (THOUSAND DOLLARS)

Year	Department of Commerce Estimate	I-O Analysis Estimate	Percent Difference
1960	--	79,885	--
1961	--	81,166	--
1962	87,896	85,199	- 3.1
1963	--	107,585	--
1964	--	99,503	--
1965	94,009	101,504	8.0
1966	97,848	109,749	12.2
1967	103,925	114,958	10.6
1968	111,795	129,381	15.7
1969	121,841	146,418	20.2
1970	133,331	158,008	18.5
1971	148,637	169,737	14.2
1972	183,140	189,465	3.5
1973	239,456	239,897	0.2
1974	307,946	245,316	-20.3
1975	344,555	302,685	-12.2
1976	393,255	377,030	- 4.1
1977	446,837	468,914	4.9
1978	526,375	532,346	1.1
1979	645,039	666,329	3.3
1980	788,862	827,782	4.9
Average Difference			9.2

Mean = 4.565 (S.D. = 10.692)
U_1 = .036

APPENDIX TABLE 58. ESTIMATES OF PERSONAL INCOME AND DIFFERENCES IN ESTIMATES, WYOMING REGION 5, 1960-1980 (THOUSAND DOLLARS)

Year	Department of Commerce Estimate	I-O Analysis Estimate	Percent Difference
1960	--	70,945	--
1961	--	63,314	--
1962	70,116	72,870	3.9
1963	--	94,055	--
1964	--	84,280	--
1965	76,888	83,217	8.2
1966	79,661	90,547	13.7
1967	85,497	97,173	13.6
1968	93,030	124,656	34.0
1969	101,791	132,961	30.6
1970	111,943	132,207	18.1
1971	122,164	129,976	6.4
1972	135,642	138,978	2.5
1973	149,114	159,850	7.2
1974	181,071	156,456	-13.6
1975	198,947	163,908	-17.6
1976	236,100	195,538	-17.2
1977	278,352	245,512	-11.8
1978	346,407	237,114	-31.6
1979	420,196	275,243	-34.5
1980	480,104	322,494	-32.8
Average Difference			17.5

Mean = -1.229 (S.D. = 21.129)
U_1 = .155

APPENDIX TABLE 59. ESTIMATES OF PERSONAL INCOME AND DIFFERENCES IN ESTIMATES, WYOMING REGION 6, 1960-1980 (THOUSAND DOLLARS)

Year	Department of Commerce Estimate	I-O Analysis Estimate	Percent Difference
1960	--	108,864	--
1961	--	108,505	--
1962	97,250	108,626	11.7
1963	--	130,959	--
1964	--	121,210	--
1965	102,249	120,385	17.7
1966	105,242	130,745	24.2
1967	114,493	134,454	17.4
1968	121,844	147,731	21.2
1969	126,517	150,560	19.0
1970	135,479	154,909	14.3
1971	150,043	170,852	13.9
1972	171,865	180,966	5.3
1973	205,951	226,256	9.9
1974	223,562	252,133	12.8
1975	248,266	277,221	11.7
1976	269,908	292,280	8.3
1977	306,085	322,577	5.4
1978	349,182	374,968	7.4
1979	413,282	435,087	5.3
1980	464,368	572,675	23.3
Average Difference			13.5

Mean = 13.459 (S.D. = 6.215)
U_1 = .066

APPENDIX TABLE 60. ESTIMATES OF PERSONAL INCOME AND DIFFERENCES IN ESTIMATES, WYOMING 1960-1980 (THOUSAND DOLLARS)

Year	Department of Commerce Estimate	I-O Analysis Estimate	Percent Difference
1960	--	713,067	--
1961	--	692,231	--
1962	794,021	728,925	- 8.2
1963	--	932,664	--
1964	--	832,471	--
1965	867,021	823,721	- 5.0
1966	897,240	890,983	- 0.7
1967	956,576	932,613	- 2.5
1968	1,027,625	1,022,711	- 0.5
1969	1,138,875	1,108,222	- 2.7
1970	1,230,422	1,172,047	- 4.7
1971	1,341,471	1,241,100	- 7.5
1972	1,524,462	1,408,326	- 7.6
1973	1,780,680	1,923,624	8.0
1974	2,069,932	1,861,329	-10.1
1975	2,328,058	2,122,031	- 8.8
1976	2,685,648	2,350,944	-12.5
1977	3,110,436	2,781,607	-10.6
1978	3,693,676	3,182,841	-13.8
1979	4,427,347	3,903,365	-11.8
1980	5,132,235	4,629,948	- 9.8
Average Difference			7.3

Mean = -6.400 (S.D. = 5.500)
U_1 = .056

APPENDIX TABLE 61. HISTORIC AND MODEL-PROJECTED EMPLOYMENT BY ECONOMIC SECTOR, WYOMING REGION 2, SELECTED YEARS 1960 TO 2005

Sector	Historic Employment			Model-Projected Employment			
	1960	1970	1980	1981	1990	2000	2005
(1) & (2) Agriculture	862	883	890	862	835	815	807
(3) Metal Mining	195	207	1,810	1,392	1,281	1,176	1,130
(4) Coal Mining	8	2	336	163	216	275	304
(5) Pet/NG Exp/Ext	2,132	2,382	5,059	5,142	4,988	4,882	4,843
(6) Nonmetallic Mining	86	118	492	447	557	675	735
(7) Construction	1,648	1,563	4,383	4,363	5,108	5,828	6,164
(8) Lumber	56	69	151	127	130	133	134
(9) Ag Proc & Misc Mfg	2,508	2,588	5,814	5,645	7,227	9,265	10,430
(10) Pet Refining	1,822	994	805	808	794	784	781
(11) Metal Proc	---	---	---	---	---	---	---
(12) Transportation	989	955	1,243	1,276	1,324	1,353	1,364
(13) Comm & Pub Util	1,117	1,122	1,583	1,554	1,638	1,684	1,703
(14) Elec Gen	625	459	326	314	292	278	274
(15) Retail	3,784	4,652	8,127	8,486	10,010	11,229	11,783
(16) FIRE	998	1,163	2,217	2,233	2,598	2,909	3,050
(17) Bus & Pers Service	1,548	1,869	3,840	3,890	4,760	5,656	6,095
(18) Prof & Soc Service	1,032	1,466	3,270	3,325	4,134	4,951	5,359
(19) Government	4,261	4,858	6,350	6,146	6,385	6,478	6,515
(20) Households	---	---	---	---	---	---	---
Project[a]	---	---	---	100	400	400	400
TOTAL	23,671	25,350	46,696	46,273	52,676	58,771	61,871

[a]Project employment includes only direct employment resulting from economic development in addition to baseline economic activity since 1980. Developments impacting Region 2 include: north, middle, and south Campbell County coal mine expansion; Campbell County uranium growth; Region 2 uranium growth; Carbon County uranium growth; Freemont County uranium growth; and Wheatland units II and III electric generating expansion. Secondary employment resulting from these projects is allocated to the appropriate sectors and included in projected employment for the respective sectors.

APPENDIX TABLE 62. HISTORIC AND MODEL-PROJECTED EMPLOYMENT BY ECONOMIC SECTOR, WYOMING REGION 3, SELECTED YEARS 1960 TO 2005

Sector	Historic Employment			Model-Projected Employment			
	1960	1970	1980	1981	1990	2000	2005
(1) & (2) Agriculture	2,566	2,438	2,297	2,273	2,189	2,122	2,096
(3) Metal Mining	262	469	1,749	1,042	983	925	899
(4) Coal Mining	28	138	1,525	1,389	1,533	1,633	1,669
(5) Pet/NG Exp/Ext	225	355	425	363	448	544	591
(6) Nonmetallic Mining	142	384	307	258	290	316	327
(7) Construction	2,441	1,499	3,457	3,538	3,691	3,800	3,846
(8) Lumber	535	606	545	566	554	545	542
(9) Ag Proc & Misc Mfg	3,392	2,917	4,328	4,317	4,599	4,849	4,959
(10) Pet Refining	1,193	431	368	344	312	293	287
(11) Metal Proc	170	120	142	144	117	91	80
(12) Transportation	1,409	965	1,715	1,656	1,605	1,559	1,541
(13) Comm & Pub Util	1,592	1,135	2,179	2,016	2,072	2,097	2,106
(14) Elec Gen	---	---	284	284	284	284	284
(15) Retail	9,563	8,276	12,067	12,988	13,593	13,861	13,969
(16) FIRE	1,939	1,583	2,888	2,954	3,405	3,818	4,008
(17) Bus & Pers Service	3,399	3,248	5,405	5,535	6,203	6,783	7,037
(18) Prof & Soc Service	2,268	2,553	4,602	3,542	4,241	4,932	5,266
(19) Government	15,599	16,493	19,891	20,480	20,651	20,580	20,552
(20) Households	---	---	---	---	---	---	---
Project[a]	---	---	---	1,231	590	590	590
TOTAL	46,723	43,610	64,144	64,919	67,360	69,623	70,651

[a]Project employment includes only direct employment resulting from economic development in addition to baseline economic activity since 1980. Developments impacting Region 3 include: north, middle, and south Campbell County coal mine expansion; Black Butte coal mine expansion; Campbell County uranium growth; Region 2 projected uranium growth; Carbon County uranium growth; Wheatland units II and III electric generating expansion; and Tenneco trona development. Secondary employment resulting from these projects is allocated to the appropriate sectors and included in projected employment for the respective sectors.

APPENDIX TABLE 63. HISTORIC AND MODEL-PROJECTED EMPLOYMENT BY ECONOMIC SECTOR, WYOMING REGION 4, SELECTED YEARS 1960 TO 2005

Sector	Historic Employment			Model-Projected Employment			
	1960	1970	1980	1981	1990	2000	2005
(1) & (2) Agriculture	1,154	1,074	1,164	1,123	1,122	1,120	1,120
(3) Metal Mining[a]	---	---	252	---	---	---	---
(4) Coal Mining	119	217	1,726	1,551	1,484	1,445	1,432
(5) Pet/NG Exp/Ext	645	986	1,310	1,436	1,420	1,408	1,403
(6) Nonmetallic Mining	930	1,121	4,807	4,208	4,432	4,613	4,678
(7) Construction	1,157	927	2,045	3,496	2,552	2,586	2,635
(8) Lumber	92	170	416	548	722	914	1,011
(9) Ag Proc & Misc Mfg	1,052	1,417	2,105	2,005	2,033	2,058	2,069
(10) Pet Refining	---	---	90	95	96	98	98
(11) Metal Proc	---	---	---	---	---	---	---
(12) Transportation	626	639	917	840	933	1,030	1,073
(13) Comm & Pub Util	706	752	1,167	1,371	1,291	1,266	1,258
(14) Elec Gen	---	513	912	950	955	958	959
(15) Retail	2,617	2,818	6,387	8,392	9,173	9,815	10,100
(16) FIRE	344	458	930	1,151	1,177	1,239	1,276
(17) Bus & Pers Service	954	972	2,205	2,575	2,803	3,064	3,180
(18) Prof & Soc Service	635	763	1,879	2,348	2,440	2,614	2,693
(19) Government	2,891	2,979	4,543	4,635	4,497	4,535	4,560
(20) Households	---	---	---	---	---	---	---
Project[b]	---	---	---	4,361	2,968	2,735	2,735
TOTAL	13,922	15,806	32,855	41,086	40,097	41,498	42,271

[a]Historic data indicates employment for the metal mining sector (Sector 3), but a productivity ratio could not be determined for projection purposes. Region 4 nonfuel mining final demand vector data could not be broken into metal and nonmetal components as only a very small part was metal mining. Productivity ratios are gross business volume divided by employment for each respective sector, thus, the lack of any gross business volume for metal mining would eliminate a productivity ratio. Region 4 metal mining employment would be reflected in the nonmetal mining sector (Sector 6).

[b]Project employment includes only direct employment resulting from economic development in addition to baseline economic activity since 1980. Developments impacting Region 4 include: Black Butte coal mine expansion; Carbon County uranium growth; Uinta County Overthrust oil activity; Texgulf Big Island trona expansion; Tenneco trona development; and Moxa Arch gas processing plant development. Secondary employment resulting from these projects is allocated to the appropriate sectors and included in projected employment for the respective sectors.

APPENDIX TABLE 64. HISTORIC AND MODEL-PROJECTED EMPLOYMENT BY ECONOMIC SECTOR, WYOMING REGION 5, SELECTED YEARS 1960 TO 2005

Sector	Historic Employment			Model-Projected Employment			
	1960	1970	1980	1981	1990	2000	2005
(1) & (2) Agriculture	1,140	855	959	915	844	791	771
(3) Metal Mining	903	1,435	2,820	2,113	2,113	2,113	2,113
(4) Coal Mining	---	---	---	---	---	---	---
(5) Pet/NG Exp/Ext	291	200	540	391	354	328	318
(6) Nonmetallic Mining	37	70	62	64	67	69	71
(7) Construction	1,025	896	2,168	1,777	2,022	2,222	2,322
(8) Lumber	214	349	68	107	101	96	95
(9) Ag Proc & Misc Mfg	381	933	1,643	1,575	1,908	2,247	2,417
(10) Pet Refining	---	---	---	---	---	---	---
(11) Metal Proc	239	696	640	491	566	643	679
(12) Transportation	202	232	447	446	558	683	754
(13) Comm & Pub Util	228	273	570	550	684	797	856
(14) Elec Gen	---	---	---	---	---	---	---
(15) Retail	1,762	2,455	4,504	4,708	6,434	8,052	8,963
(16) FIRE	239	343	738	660	810	922	978
(17) Bus & Pers Service	708	1,316	2,383	2,417	2,990	3,566	3,854
(18) Prof & Soc Service	473	1,035	2,031	2,011	2,484	2,828	3,000
(19) Government	2,378	2,582	3,626	2,847	3,306	3,557	3,673
(20) Households	---	---	---	---	---	---	---
Project[a]	---	---	---	25	500	500	500
TOTAL	10,220	13,670	23,199	21,097	25,740	29,415	31,362

[a]Project employment includes only direct employment resulting from economic development in addition to baseline economic activity since 1980. Developments impacting Region 5 include: Black Butte coal mine expansion; Carbon County uranium growth; and Freemont County uranium growth. Secondary employment resulting from these projects is allocated to the appropriate sectors and included in projected employment for the respective sectors.

APPENDIX TABLE 65. HISTORIC AND MODEL-PROJECTED EMPLOYMENT BY ECONOMIC SECTOR, WYOMING REGION 6, SELECTED YEARS 1960 TO 2005

Sector	Historic Employment			Model-Projected Employment			
	1960	1970	1980	1981	1990	2000	2005
(1) & (2) Agriculture	1,879	1,485	1,546	1,508	1,423	1,360	1,336
(3) Metal Mining	---	---	---	---	---	---	---
(4) Coal Mining	---	8	7	6	5	4	3
(5) Pet/NG Exp/Ext	1,085	1,136	1,021	821	859	901	922
(6) Nonmetallic Mining	209	303	443	420	429	436	439
(7) Construction	849	790	2,047	2,286	2,727	3,332	3,694
(8) Lumber	289	329	415	395	404	410	413
(9) Ag Proc & Misc Mfg	1,265	2,561	3,899	4,129	4,915	5,788	6,225
(10) Pet Refining	489	317	258	250	222	203	196
(11) Metal Proc	---	---	---	---	---	---	---
(12) Transportation	504	447	624	561	579	597	605
(13) Comm & Pub Util	565	522	795	823	799	778	770
(14) Elec Gen	---	---	---	---	---	---	---
(15) Retail	2,906	3,151	4,339	4,661	4,842	5,002	5,071
(16) FIRE	455	535	964	983	1,147	1,333	1,429
(17) Bus & Pers Service	920	1,140	1,754	1,738	1,939	2,136	2,225
(18) Prof & Soc Service	611	898	1,490	1,458	1,678	1,923	2,046
(19) Government	3,644	3,250	3,802	3,977	3,913	3,859	3,838
(20) Households	---	---	---	---	---	---	---
Project[a]	---	---	---	---	---	---	---
TOTAL	15,670	16,872	23,404	24,015	25,880	28,064	29,212

[a]Project employment includes only direct employment resulting from economic development in addition to baseline economic activity since 1980. Region 6 has experienced no development projects but secondary impacts have resulted from activity in adjacent regions. Developments affecting Region 6 include: north, middle, and south Campbell County coal mine expansion. Secondary employment resulting from these projects is allocated to the appropriate sectors and included in projected employment for the respective sectors.

APPENDIX TABLE 66. HISTORIC AND MODEL-PROJECTED EMPLOYMENT BY ECONOMIC SECTOR, WYOMING, SELECTED YEARS 1960 TO 2005

Sector	Historic Employment			Model-Projected Employment			
	1960	1970	1980	1981	1990	2000	2005
(1) & (2) Agriculture	9,604	8,762	8,737	8,529	8,210	7,965	7,872
(3) Metal Mining[a]	1,360	2,111	6,633	4,550	4,380	4,217	4,145
(4) Coal Mining	271	666	6,709	5,364	4,889	4,644	4,572
(5) Pet/NG Exp/Ext	5,764	8,003	10,932	10,689	10,799	10,934	11,001
(6) Nonmetallic Mining	1,493	2,112	6,553	5,893	6,339	6,773	6,963
(7) Construction	8,107	6,628	18,017	20,956	21,915	25,319	27,193
(8) Lumber	1,458	1,744	2,158	2,306	2,527	2,756	2,869
(9) Ag Proc & Misc Mfg	9,845	11,729	19,829	19,756	22,728	26,206	28,080
(10) Pet Refining	3,545	1,813	1,728	1,629	1,564	1,524	1,510
(11) Metal Proc	409	816	782	635	683	734	759
(12) Transportation	4,288	3,876	5,692	5,610	5,831	6,047	6,158
(13) Comm & Pub Util	4,836	4,551	7,243	7,363	7,556	7,694	7,764
(14) Elec Gen	804	1,056	1,665	1,703	1,670	1,649	1,643
(15) Retail	23,545	25,406	41,171	46,021	51,746	55,864	57,863
(16) FIRE	4,432	4,811	8,940	9,251	10,554	11,752	12,322
(17) Bus & Pers Service	8,373	9,809	17,861	18,646	21,600	24,498	25,864
(18) Prof & Soc Service	5,583	7,705	15,207	14,608	17,242	19,834	21,103
(19) Government	32,212	33,708	43,143	43,352	44,198	44,504	44,647
(20) Households	---	---	---	---	---	---	---
Project[b]	---	---	---	6,885	6,064	5,880	5,880
TOTAL	125,929	135,216	223,001	233,746	250,495	268,794	278,208

[a]Project employment includes only direct employment resulting from economic development in addition to baseline economic activity since 1980. These developments include all projects from the six state regions. Secondary employment resulting from these projects is allocated to the appropriate sectors and included in projected employment for the respective sectors.

APPENDIX TABLE 67. HISTORIC POPULATION AND MODEL-PROJECTED POPULATION, BY CITY AND COUNTY, WYOMING REGION 2, BY SELECTED YEARS

County/City	Census Population			Model-Projected Population[a]				
	1960	1970	1980	1985	1990	1995	2000	2005
Converse County	6,366	5,938	14,069	16,036	17,164	18,412	19,160	20,119
Douglas	2,822	2,677	6,030	7,170	7,953	8,660	9,405	10,332
Glenrock	1,584	1,515	2,736	3,058	3,346	3,668	3,818	3,928
Natrona County	49,623	51,264	71,856	79,784	87,030	93,397	99,983	107,268
Alcova[b]	100	100	200	220	249	265	283	308
Casper	38,930	39,361	51,016	57,083	62,257	66,867	71,758	76,609
Edgerton	512	350	510	549	569	577	567	551
Evansville	678	832	2,652	3,100	3,545	3,808	4,095	5,037
Midwest	---	---	638	714	778	820	823	809
Mills	1,477	1,724	2,139	2,379	2,593	2,705	2,697	2,641
Niobrara County	3,750	2,924	2,924	2,941	3,032	3,079	2,985	2,895
Lusk	1,890	1,495	1,650	1,732	1,818	1,851	1,762	1,679
Lance Creek[b]	90	90	90	94	99	104	108	108
Manville	124	92	94	99	100	95	86	80
REGION 2	59,739	60,126	88,849	98,761	107,227	114,889	122,129	130,281

[a]Based on a birthrate of 2.1 births per female, unallocated labor pool maximum = 0.07 and minimum = 0.01, family size for construction, energy operating, nonenergy operating, indirect, and baseline is 2.291, 3.535, 3.535, 2.100, and 2.100, respectively. The maximum fraction of city workers who can work on farms is 0.2, and the maximum fraction of rural workers who can work in cities is 0.2.
[b]Census populations were unavailable, so 1960, 1970, and 1980 population estimates were based on information provided by the county agent's office.

APPENDIX TABLE 68. HISTORIC POPULATION AND MODEL-PROJECTED POPULATION, BY CITY AND COUNTY, WYOMING REGION 3, BY SELECTED YEARS

County/City	Census Population			Model-Projected Population[a]				
	1960	1970	1980	1985	1990	1995	2000	2005
Albany County	21,290	26,431	29,062	33,120	35,525	37,597	37,874	36,887
Laramie	17,520	23,143	24,410	28,018	30,338	32,278	32,671	31,873
Rock River	497	344	415	447	432	416	380	338
Carbon County	14,937	13,354	21,896	23,409	25,698	28,077	30,030	32,958
Baggs	199	146	433	464	504	541	582	684
Dixon	108	72	82	75	70	66	58	54
Elk Mountain	190	127	338	369	399	428	461	499
Encampment	333	321	611	657	711	763	821	904
Hanna	625	460	2,288	2,546	2,794	3,004	3,235	4,810
Medicine Bow	392	455	953	1,105	1,195	1,297	1,369	1,649
Rawlins	8,968	7,855	11,547	12,046	12,491	12,734	12,547	12,514
Riverside	87	46	55	50	44	37	32	28
Saratoga	1,133	1,181	2,410	2,599	2,842	3,044	3,269	3,777
Sinclair	621	445	586	579	568	549	518	499
Goshen County	11,941	10,885	12,040	12,531	12,867	13,057	12,893	12,697
Fort Laramie	233	197	356	374	392	406	422	441
LaGrange	176	189	232	235	244	252	251	246
Lingle	437	446	475	476	480	483	474	464
Torrington	4,188	4,237	5,441	5,584	5,763	5,906	5,838	5,730
Yoder	83	101	110	111	116	120	119	117
Laramie County	60,149	56,360	68,649	72,653	77,416	81,794	82,253	81,083
Albin	172	118	128	124	120	117	107	95
Burns	225	185	268	284	312	336	346	348
Carpenter[b]	50	50	50	50	54	55	55	52
Cheyenne	43,505	41,273	47,264	49,721	53,096	56,124	56,323	55,258
Federal[b]	10	10	10	10	10	11	11	11
Horse Creek	15	15	15	14	15	16	16	16
Pine Bluffs	1,121	937	1,077	1,098	1,140	1,171	1,136	1,080
Platte County	7,195	6,486	11,975	11,259	11,221	11,113	10,856	10,847
Chugwater	287	187	282	249	240	232	219	214
Glendo	292	210	367	347	346	344	336	327
Guernsey	800	793	1,512	1,422	1,486	1,545	1,605	1,805
Hartville	177	246	149	126	116	107	97	92
Wheatland	2,350	2,498	5,816	5,262	5,105	4,867	4,573	4,389
REGION 3	115,512	113,516	143,622	152,973	162,727	171,638	173,895	174,471

[a]Based on a birthrate of 2.1 births per female, unallocated labor pool maximum = 0.07 and minimum = 0.01, family size for construction, energy operating, nonenergy operating, indirect, and baseline is 2.291, 3.535, 3.535, 2.950, and 2.950, respectively. The maximum fraction of city workers who can work on farms is 0.2, and the maximum fraction of rural workers who can work in cities is 0.2.
[b]Census populations were unavailable, so 1960, 1970, and 1980 population estimates were based on information provided by the county agent's office.

APPENDIX TABLE 69. HISTORIC POPULATION AND MODEL-PROJECTED POPULATION, BY CITY AND COUNTY, WYOMING REGION 4, BY SELECTED YEARS

County/City	Census Population			Model-Projected Population[a]				
	1960	1970	1980	1985	1990	1995	2000	2005
Lincoln County	9,018	8,640	12,177	12,537	12,611	12,401	11,821	11,704
Afton	1,337	1,290	1,481	1,455	1,310	1,167	1,020	938
Cokeville	545	445	515	497	427	366	309	273
Diamondville	398	485	1,000	1,115	1,175	1,246	1,295	1,310
Kemmerer	2,028	2,292	3,273	3,696	3,886	4,020	3,860	3,871
LaBarge	---	---	302	321	312	289	264	249
Thayne	214	195	256	252	234	211	190	177
Sublette County	3,773	3,755	4,548	4,492	4,528	4,475	4,360	4,354
Big Piney	663	570	530	408	340	287	238	204
Marbleton	189	223	537	504	532	562	594	625
Pinedale	965	948	1,066	870	786	726	655	610
Sweetwater County	17,920	18,391	41,723	44,901	48,467	48,952	48,926	49,881
Eden[b]	50	50	50	42	39	34	29	27
Granger	159	137	177	549	825	701	582	531
Green River	3,497	4,196	12,807	14,770	17,306	18,088	18,936	20,097
Rock Springs	10,371	11,657	19,458	20,523	19,918	19,007	17,386	16,266
South Superior	401	197	586	624	599	584	553	541
Wansutter	110	139	681	757	818	873	932	1,075
Uinta County	7,484	7,100	13,021	16,775	16,778	16,389	15,404	16,058
Evanston	4,901	4,462	6,421	7,500	6,925	5,873	4,701	4,839
Lyman	425	643	2,284	1,975	2,116	2,295	2,295	2,198
Mountain View	1,721	---	628	360	248	173	110	75
REGION 3	38,195	38,886	71,469	78,706	82,385	82,218	80,511	81,997

[a]Based on a birthrate of 2.1 births per female, unallocated labor pool maximum = 0.07 and minimum = 0.01, family size for construction, energy operating, nonenergy operating, indirect, and baseline is 2.291, 3.535, 3.535, 2.800, and 2.800, respectively. The maximum fraction of city workers who can work on farms is 0.2, and the maximum fraction of rural workers who can work in cities is 0.2.

[b]Census populations were unavailable, so 1960, 1970, and 1980 population estimates were based on information provided by the county agent's office.

APPENDIX TABLE 70. HISTORIC POPULATION AND MODEL-PROJECTED POPULATION, BY CITY AND COUNTY, WYOMING REGION 5, BY SELECTED YEARS

County/City	Census Population			Model-Projected Population[a]				
	1960	1970	1980	1985	1990	1995	2000	2005
Freemont County	26,168	28,352	38,992	39,584	42,451	45,303	47,423	50,088
Dubois	574	898	1,067	1,064	1,154	1,238	1,334	1,447
Hudson	369	381	514	510	555	596	635	664
Jeffrey City	---	---	825	823	893	966	1,051	1,157
Lander	4,182	7,125	9,126	9,237	10,341	11,088	12,232	13,794
Pavillion	190	181	287	285	311	333	356	383
Riverton	6,845	7,995	9,588	9,584	10,489	11,255	12,019	12,841
Shoshoni	766	562	879	841	889	909	894	892
Teton County	3,062	4,823	9,355	10,427	12,252	14,351	16,397	18,708
Jackson	1,437	2,688	4,511	3,983	4,346	4,659	5,852	7,777
REGION 5	29,230	33,175	48,347	50,011	54,703	59,655	68,820	68,796

[a]Based on a birthrate of 2.1 births per female, unallocated labor pool maximum = 0.07 and minimum = 0.01, family size for construction, energy operating, nonenergy operating, indirect, and baseline is 2.291, 3.535, 3.535, 3.000, and 3.000, respectively. The maximum fraction of city workers who can work on farms is 0.2, and the maximum fraction of rural workers who can work in cities is 0.2.

APPENDIX TABLE 71. HISTORIC POPULATION AND MODEL-PROJECTED POPULATION, BY CITY AND COUNTY, WYOMING REGION 6, BY SELECTED YEARS

County/City	Census Population			Model-Projected Population[a]				
	1960	1970	1980	1985	1990	1995	2000	2005
Big Horn County	11,898	10,202	11,896	12,047	11,963	11,936	12,002	12,208
Basin	1,319	1,145	1,349	1,376	1,405	1,434	1,465	1,490
Byron	417	397	633	645	658	672	686	698
Cowley	459	366	455	464	473	483	492	500
Deaver	121	112	178	181	185	189	193	196
Frannie	171	139	138	141	140	130	123	120
Greybull	2,286	1,953	2,277	2,320	2,367	2,417	2,468	2,512
Lovell	2,451	2,371	2,447	2,493	2,544	2,597	2,653	2,699
Manderson	167	117	174	177	181	185	189	192
Hot Springs County	6,365	4,952	5,710	6,093	6,531	6,944	7,316	7,552
East Thermopolis	281	316	359	391	425	452	481	518
Kirby	82	75	129	141	153	164	175	188
Thermopolis	3,955	3,063	3,852	4,154	4,462	4,753	5,076	5,261
Park County	16,874	17,752	21,639	23,643	25,395	27,362	28,992	30,498
Cody	4,838	5,161	6,790	7,446	8,112	8,749	9,382	10,124
Meeteetse	514	459	512	555	600	640	660	675
Powell	4,740	4,807	5,310	5,823	6,344	6,842	7,337	7,918
Washakie County	8,883	7,569	9,496	10,133	10,727	11,326	11,948	12,673
Ten Sleep	314	320	407	440	479	512	550	594
Worland	5,806	5,055	6,391	6,907	7,441	7,966	8,562	9,236
REGION 5	44,020	40,475	48,741	51,916	54,616	57,568	60,259	62,930

[a]Based on a birthrate of 2.1 births per female, unallocated labor pool maximum = 0.07 and minimum = 0.01, family size for construction, energy operating, nonenergy operating, indirect, and baseline is 2.291, 3.535, 3.535, 2.300, and 2.300, respectively. The maximum fraction of city workers who can work on farms is 0.2, and the maximum fraction of rural workers who can work in cities is 0.2.

APPENDIX C

STANDARD OUTPUT REPORTS

WYOMING
ECONOMIC + DEMOGRAPHIC
SIMULATION MODEL

EMODEL RUN NUMBER: 576

4/16/1983 6:33

EMODEL IS RUN FROM 1981 UNTILL 2005

COUNTIES INCLUDED IN THIS EMODEL RUN ARE: 1 2 3 4 5
PROJECTS INCLUDED IN THIS EMODEL RUN ARE: 1 3 5 17 23 30 31

PROJECT NUMBER	PROJECT NAME	DESCRIPTION	STARTING DATE	PROJECT TOWN	SECONDRY TOWNS		DISTANCE TO SITE		
1	CAMPN1	WY01 NORTH CAMPBELL CO COAL EXPANSION	1981	1	4	2	8	36	41
3	CAMPMID1	WY03 MIDDLE CAMPBELL CO COAL EXPANSION	1981	1	2	4	18	36	42
5	CAMPS1	WY05 SOUTH CAMPBELL CO COAL EXPANSION	1981	2	1	19	13	52	11
17	CAMPUR2	WY17 CAMPBELL CO URANIUM PROJECTED GROWTH	1981	2	19	21	16	62	33
23	CARBUR1	WY23 CARBON CO URANIUM PROJECTED GROWTH	1981	33	17	27	40	54	63
30	WHEAT1	WY30 WHEATLAND II (500 MW) UNIT	1981	54	52	50	6	30	3.
31	WHEAT2	WY31 WHEATLAND III (500MW) UNIT	1981	54	52	50	5	30	31

GRAVITY POWERS :	CONSTRUCTION	OPERATING(E)	OPERATING(NE)	INDIRECT
	1.5000	2.9000	2.9000	1.6000

==========

DMODEL RUN NUMBER: 576-1 RUN DATE IS 4/16/1983 6:41
DMODEL WAS RUN UNTILL: 2005
COUNTIES INCLUDED IN THIS DMODEL RUN: 1 2 3 4 5

BIRTHRATE = 2.10 UNALLOCATED LABOR POOL: MAX = .07 MIN = .01

FAMILY SIZE:	CONSTRUCTION	OPERATING(E)	OPERATING(NE)	INDIRECT	BASELINE
	2.29100	3.53500	3.53500	2.17000	2.17000

WORK FORCE PARTICIPATION RATE WEIGHTS:

NUMBER	COUNTY	MALE	FEMALE
1	CAMPBELL	1.20000	1.22000
2	CROOK	.96000	.93000
3	JOHNSON	.99000	.95000
4	SHERIDAN	.86000	.82000
5	WESTON	.96000	.94000

PERCENT OF CITY WORKERS WHO CAN WORK ON FARMS: 0.2

PERCENT OF RURAL WORKERS WHO CAN WORK IN THE CITIES: 0.2

==========

DMODEL RUN NUMBER: 576-1 RUN DATE IS 4/16/1983 6:41
DMODEL WAS RUN UNTIL: 2005
COUNTIES INCLUDED IN THIS DMODEL RUN: 1 2 3 4 5

BIRTHRATE = 2.10 UNALLOCATED LABOR POOL: MAX = .07 MIN = .01

FAMILY SIZE: CONSTRUCTION	OPERATING(E)	OPERATING(NE)	INDIRECT	BASELINE
2.29100	3.53500	3.53500	2.17000	2.17000

WORK FORCE PARTICIPATION RATE WEIGHTS:

NUMBER	COUNTY	MALE	FEMALE
1	CAMPBELL	1.20000	1.22000
2	CROOK	.96000	.93000
3	JOHNSON	.99000	.95000
4	SHERIDAN	.86000	.82000
5	WESTON	.96000	.94000

PERCENT OF CITY WORKERS WHO CAN WORK ON FARMS: 0.2

PERCENT OF RURAL WORKERS WHO CAN WORK IN THE CITIES: 0.2

REGIONAL ECONOMIC ACTIVITY REPORT

YEAR	←PROJECT RELATED→ BUSINESS ACTIVITY ($000)	←PROJECT RELATED→ PERSONAL INCOME ($000)	←BASE LINE→ BUSINESS ACTIVITY ($000)	←BASE LINE→ PERSONAL INCOME ($000)	←TOTAL BUSINESS ACTIVITY→ AMT ($000)	CHNG ($000)	PCT CHNG	←PERSONAL INCOME→ AMT ($000)	CHNG ($000)	PCT CHNG	←PER CAPITA→ AMT ($)	CHNG ($)	PCT CHNG
1981	200241	139350	2015817	743906	2216058	0	0	883256	0	0	12782	0	0
1982	212370	146976	2065924	759750	2278294	62236	3	906726	23470	3	12969	187	1
1983	184547	126742	2116030	775595	2300577	22283	1	902337	-4389	0	13029	60	0
1984	209788	144073	2166139	791440	2375927	75350	3	935513	33176	4	13346	317	2
1985	222853	153048	2216249	807285	2439102	63175	3	960333	24820	3	13560	214	2
1986	229402	157543	2266355	823130	2495757	56655	2	980673	20340	2	13718	158	1
1987	237046	162793	2316463	838975	2553509	57752	2	1001768	21095	2	13877	159	1
1988	243975	167552	2366571	854819	2610546	57037	2	1022371	20603	2	14032	155	1
1989	254820	175000	2416677	870664	2671497	60951	2	1045664	23293	2	14216	184	1
1990	264790	181848	2466788	886509	2731578	60081	2	1068357	22693	2	14327	111	1
1995	269676	185202	2717326	965733	2987002	255424	9	1150935	82578	8	14935	608	4
2000	269676	185202	2967867	1044958	3237543	250541	8	1230160	79225	7	15947	1012	7
2005	269676	185202	3218405	1124182	3488081	250538	8	1309384	79224	6	16419	472	3

NOTE: 1980 POPULATIONS ARE THE CENSUS DATA
2 2

AREA
AGGREGATE SUMMARY
(FOR SELECTED COUNTIES OF REGIONS)

YEAR	←POPULATION→			←PROJECT→			←BASELINE→			SUMMARY		
	TOTAL POPULATION											
	POPULATION	CHANGE	PERCENT CHANGE	CONSTR	ENERG OPER	NON-ENERG OPER	INDIRECT	NON-AG EMPLOYMNT	AG EMPLOYMNT	TOTAL	CHANGE	PERCENT
1980	68529											
1981	69104	575	1	695	297	0	2156	30189	1847	35184	0	0
1982	69917	814	1	438	681	0	1839	30427	1841	35226	42	0
1983	69254	-664	-1	0	883	0	1410	30670	1833	34796	-430	-1
1984	70096	842	1	0	1050	0	1672	30918	1830	35470	674	2
1985	70821	726	1	0	1138	0	1793	31170	1817	35918	448	1
1986	71487	666	1	0	1203	0	1882	31423	1816	36324	406	1
1987	72191	704	1	0	1277	0	1991	31683	1814	36765	441	1
1988	72859	668	1	0	1353	0	2088	31947	1805	37193	428	1
1989	73556	698	1	0	1454	0	2250	32215	1803	37722	529	1
1990	74572	1015	1	0	1553	0	2395	32483	1796	38227	505	1
1995	77062	2490	3	0	1600	0	2370	33873	1773	39616	1389	4
2000	77139	77	0	0	1599	0	2270	35323	1758	40950	1334	3
2005	79747	2608	3	0	1596	0	2187	36846	1743	42372	1422	3

NOTE: 1980 POPULATIONS ARE THE CENSUS DATA
2 2

COUNTY SUMMARY

COUNTY: CAMPBELL

YEAR	POPULATION	TOTAL POPULATION CHANGE	TOTAL POPULATION PERCENT CHANGE	PROJECT EMPLOYMENT CONSTR	PROJECT EMPLOYMENT ENERG OPER	PROJECT EMPLOYMENT NON-ENERG OPER	BASELINE EMPLOYMENT INDIRECT	BASELINE EMPLOYMENT NON-AG EMPLOYMNT	BASELINE EMPLOYMENT AG EMPLOYMNT	SUMMARY TOTAL	SUMMARY CHANGE	SUMMARY PERCENT
1980	24367											
1981	24713	346	1	623	295	0	1977	11887	394	15176	0	0
1982	25233	520	2	384	670	0	1656	12094	392	15196	20	0
1983	24388	-845	-3	0	870	0	1289	12307	392	14858	-338	-2
1984	24902	514	2	0	1036	0	1531	12526	390	15483	625	4
1985	25252	350	1	0	1124	0	1644	12749	388	15905	422	3
1986	25515	263	1	0	1188	0	1733	12975	388	16284	379	2
1987	25774	259	1	0	1262	0	1839	13199	386	16686	402	2
1988	25999	225	1	0	1338	0	1934	13426	386	17084	398	2
1989	26312	313	1	0	1439	0	2091	13659	384	17573	489	3
1990	26962	649	2	0	1537	0	2235	13896	384	18052	479	3
1995	27762	820	3	0	1585	0	2230	15110	378	19303	1251	7
2000	27130	-652	-2	0	1585	0	2147	16389	374	20495	1192	6
2005	29382	2252	8	0	1583	0	2077	17738	372	21770	1275	6

NOTE: 1980 POPULATIONS ARE THE CENSUS DATA

MUNICIPALITY REPORT

1 GILLETTE

YEAR	POPULATION	CHANGE	PERCENT CHANGE	PROJECT CONSTR	PROJECT ENERG OPER	PROJECT NON-ENERG OPER	BASELINE INDIRECT	BASELINE NON-AG EMPLOYMNT	BASELINE AG EMPLOYMNT	SUMMARY TOTAL	SUMMARY CHANGE	SUMMARY PERCENT
	TOTAL POPULATION			PROJECT			BASELINE			SUMMARY		
1980	12134											
1981	13378	1244	10	606	215	0	1891	5553	0	8265	0	0
1982	13790	413	3	372	517	0	1534	5761	0	8184	-81	-1
1983	12967	-824	-6	0	664	0	1145	5975	0	7784	-400	-5
1984	13523	556	4	0	815	0	1369	6194	0	8378	594	8
1985	13919	396	3	0	898	0	1478	6418	0	8794	416	5
1986	14228	309	2	0	963	0	1569	6646	0	9178	384	4
1987	14544	316	2	0	1037	0	1677	6872	0	9586	408	4
1988	14832	288	2	0	1113	0	1775	7102	0	9990	404	4
1989	15224	392	3	0	1214	0	1933	7337	0	10484	494	5
1990	15954	731	5	0	1315	0	2082	7577	0	10974	490	5
1995	16796	841	5	0	1374	0	2100	8811	0	12285	1311	12
2000	15957	-839	-5	0	1384	0	2036	10115	0	13535	1250	10
2005	17439	1482	9	0	1394	0	1983	11492	0	14869	1334	10

2 WRIGHT

1980	1200											
1981	1193	-7	-1	17	80	0	86	549	0	732	0	0
1982	1363	170	14	12	153	0	122	548	0	835	103	14
1983	1444	81	6	0	206	0	144	547	0	897	62	7
1984	1499	55	4	0	221	0	162	547	0	930	33	4
1985	1523	24	2	0	226	0	166	546	0	938	8	1
1986	1542	18	1	0	225	0	164	544	0	933	-5	-1
1987	1549	7	0	0	225	0	162	542	0	929	-4	0
1988	1526	-23	-1	0	225	0	159	539	0	923	-6	-1
1989	1509	-17	-1	0	225	0	158	537	0	920	-3	0
1990	1480	-29	-2	0	222	0	153	534	0	909	-11	-1
1995	1346	-134	-9	0	211	0	130	514	0	855	-54	-6
2000	1223	-124	-9	0	201	0	111	489	0	801	-54	-6
2005	1133	-89	-7	0	189	0	94	461	0	744	-57	-7

FOR THE SELECTED COUNTIES

PROJECTED POPULATIONS FOR THE YEAR 1981

COUNTY	SEX	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70+	TOTAL
CAMPBELL	M	1772	1286	1022	1105	1685	1773	1367	829	590	519	415	287	188	107	154	13059
	F	1640	1194	1014	1048	1434	1491	1147	688	542	411	320	239	152	119	215	11654
CROOK	M	332	229	221	265	209	236	195	179	133	140	114	115	132	94	141	2734
	F	284	202	230	247	209	185	181	175	128	123	117	120	112	103	159	2575
JOHNSON	M	348	276	281	257	239	310	245	218	178	152	149	169	147	136	264	3368
	F	302	268	258	263	239	309	232	224	160	151	145	163	143	145	362	3373
SHERIDAN	M	1378	1017	934	1019	1033	1301	1130	802	635	509	599	573	555	459	741	12685
	F	1280	935	909	1013	1057	1173	958	743	585	512	598	586	566	520	1161	12595
WESTON	M	435	284	286	327	322	341	271	192	180	184	174	161	134	85	184	3560
	F	400	289	280	283	316	313	231	208	194	163	158	168	128	119	232	3462

PROJECTED POPULATIONS FOR THE YEAR 1990

COUNTY	SEX	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70+	TOTAL
CAMPBELL	M	966	1041	1728	1219	1010	1165	1725	1604	1135	730	504	429	324	196	251	14027
	F	967	1042	1639	1170	974	1099	1466	1422	952	628	483	338	267	168	319	12934
CROOK	M	291	260	281	206	197	201	197	192	161	147	106	117	93	117	298	2862
	F	291	260	239	173	202	204	185	163	157	140	108	105	93	118	349	2789
JOHNSON	M	298	286	335	267	257	240	240	285	221	203	157	133	147	137	413	3623
	F	299	286	321	261	238	245	247	279	221	201	145	145	132	149	521	3490
SHERIDAN	M	1317	1311	1288	965	926	980	1032	1250	1012	733	556	480	549	474	1217	14090
	F	1317	1312	1180	900	927	955	1062	1144	857	678	542	510	532	541	1650	14107
WESTON	M	293	283	340	238	220	260	266	264	193	148	145	135	141	92	223	3241
	F	293	284	319	224	233	223	257	238	190	160	144	126	125	122	274	3212

POPULATION SUMMARY---CAMPBELL

YEAR	BIRTH	DEATH	NET NATURAL INCREASE	EMPLOYMENT RELATED MIGRATION CONST.	OPER-E	OPER-N	INDIRECT	BASELINE	OTHER MIGRATION	TOTAL MIGRATION	TOTAL POPULATION CHANGE	POPULATION
1981	360	44	317	432	211	0	2644	-3243	-14	30	346	24713
1982	370	42	328	-75	260	0	447	-427	-13	192	520	25233
1983	380	44	336	-333	126	0	-637	-324	-14	-1181	-845	24388
1984	369	45	324	-23	97	0	356	-225	-15	191	514	24902
1985	372	47	325	-2	39	0	198	-195	-15	25	350	25252
1986	371	49	322	0	25	0	117	-184	-16	-59	263	25515
1987	368	51	317	0	30	0	115	-186	-17	-58	259	25774
1988	362	53	309	0	30	0	82	-177	-19	-83	225	25999
1989	355	55	300	0	47	0	178	-192	-20	13	313	26312
1990	351	57	293	0	394	0	152	-170	-21	356	649	26962
1995	1756	327	1429	0	680	0	-756	-407	-126	-609	820	27782
2000	1762	392	1369	0	-532	0	-985	-345	-159	-2021	-652	27130
2005	1830	466	1364	0	792	0	46	244	-194	888	2252	29382

.$REPORTS

EMPLOYMENT BY SECTOR, REGION1

SECTOR	YEAR												
	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1995	2000	2005
AG.	1848	1842	1835	1829	1823	1817	1812	1807	1802	1797	1775	1757	1742
METAL MINING	3	3	3	3	3	3	3	3	3	3	3	3	3
COAL MINING	2255	2165	2083	2006	1936	1871	1810	1753	1701	1651	1444	1287	1164
PET. EXP./ EXT.	2536	2562	2587	2611	2633	2654	2675	2694	2713	2730	2808	2871	2924
OTHER MINING	496	497	489	500	511	522	532	543	553	564	614	664	713
CONTRACT CONST.	5496	5234	4653	4823	4983	5141	5304	5468	5640	5815	6651	7551	8532
LUMBER/ PROD.	563	570	577	583	589	595	601	606	611	616	639	658	674
WHSL. TRADE /AG. PROC.	2085	2083	2069	2068	2064	2060	2056	2052	2049	2046	2021	1999	1980
PET. REF.	132	133	134	135	136	137	137	138	139	140	143	146	148
METAL PROC.	0	0	0	0	0	0	0	0	0	0	0	0	0
TRANS.	831	832	820	825	826	827	828	829	831	832	829	825	821
COM. UTIL.	1049	1053	1030	1042	1048	1052	1056	1061	1067	1072	1074	1072	1071
THERMAL POW. GEN.	155	152	150	148	146	145	143	141	140	139	133	129	126
RETAIL TRADE	6786	7001	6949	7127	7231	7313	7402	7483	7593	7694	7824	7905	7977
F. I. R. E.	1270	1287	1264	1294	1316	1335	1355	1374	1396	1417	1478	1531	1581
BUS./PERS. SERVICES	2491	2537	2528	2593	2647	2697	2748	2798	2852	2905	3106	3293	3473
PROF./SOC. SERVICES	1924	1961	1937	1996	2042	2084	2128	2170	2219	2265	2431	2586	2739
GOV.	5267	5288	5157	5229	5270	5301	5335	5365	5400	5446	5480	5495	5509
PROJECT	1168	1243	922	1094	1184	1250	1327	1404	1506	1606	1655	1655	1655
TOTAL	36355	36443	35189	35906	36388	36803	37251	37688	38222	38738	40108	41427	42832

CAMPBELL

CRIMINAL JUSTICE REPORT

YEAR	TOTAL OFFENSES	JUVENILE OFFENSES	VIOLENT CRIMES	PROPERTY CRIMES	ALL OTHER OFFENSES	OFFICERS REQUIRED	VEHICLES REQUIRED
1981	95.17	29.13	4.00	14.09	77.09	6.57	2.19
1982	115.18	35.75	4.84	17.05	93.30	7.92	2.64
1983	92.24	29.24	3.87	13.65	74.71	6.33	2.11
1984	106.83	33.97	4.49	15.81	86.54	7.27	2.42
1985	116.33	37.07	4.89	17.22	94.23	7.83	2.61
1986	123.39	39.41	5.18	18.26	99.94	8.21	2.74
1987	130.66	41.57	5.49	19.34	105.83	8.61	2.87
1988	137.12	43.45	5.76	20.29	111.06	8.94	2.98
1989	146.85	46.37	6.17	21.73	118.95	9.50	3.17
1990	166.02	52.35	6.97	24.57	134.47	10.71	3.57
1995	186.16	62.66	7.82	27.55	150.79	11.26	3.75
2000	145.71	39.02	6.12	21.57	118.03	8.91	2.97
2005	170.43	42.71	7.16	25.22	138.05	11.21	3.74

COUNTY SERVICES REPORT

YEAR	NO. PHYSICIAN VISITS	NO. PERSONS HOSPITALIZED	NO. PATIENT DAYS	NO. OF DOCTORS REQUIRED	NO. OF HOSPITAL BEDS REQUIRED
1981	113.60	289.59	1.91	3.29	13.15
1982	137.20	350.34	2.32	3.96	15.83
1983	110.14	281.41	1.88	3.16	12.65
1984	126.81	325.06	2.19	3.63	14.54
1985	136.94	352.56	2.40	3.92	15.66
1986	143.96	372.31	2.56	4.11	16.43
1987	151.25	393.23	2.73	4.30	17.21
1988	157.51	411.72	2.89	4.47	17.88
1989	167.73	440.27	3.11	4.75	18.99
1990	189.13	497.16	3.52	5.35	21.41
1995	201.13	540.04	4.07	5.63	22.52
2000	162.36	450.89	3.69	4.45	17.81
2005	204.81	569.81	4.78	5.60	22.41

CONCLUSION OF SERVICES.
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HOUSING REPORT - IMPACT

COUNTY : CAMPBELL

YEAR	SINGLE FAMILY HOUSING	APARTMENTS	MOBILE HOMES	OTHER HOUSING
1981	222	102	0	24
1982	135	163	547	24
1983	509	201	518	9
1984	607	228	180	10
1985	694	249	211	11
1986	793	269	229	11
1987	868	300	242	12
1988	974	330	258	13
1989	1041	356	271	14
1990	1085	374	290	20
1995	1171	393	379	33
2000	1228	407	306	30
2005	1284	431	403	46

COUNTY SCHOOL ENROLLMENT REPORT

COUNTY: CAMPBELL

YEAR	IMPACT STUDENTS PRIMARY	IMPACT STUDENTS SECONDARY	IMPACT STUDENTS TOTAL	ALL STUDENTS PRIMARY	ALL STUDENTS SECONDARY	ALL STUDENTS TOTAL
1981	439	401	840	2798	2514	5312
1982	568	490	1058	2938	2531	5469
1983	489	400	889	2703	2445	5148
1984	585	462	1047	3040	2529	5572
1985	659	500	1159	3625	2593	6218
1986	722	527	1249	3598	2655	6253
1987	732	570	1302	3517	2785	6302
1988	724	613	1337	3403	2850	6253
1989	729	671	1400	3295	2968	6263
1990	770	774	1544	3013	3454	6467
1995	650	780	1430	2936	3197	6133
2000	599	494	893	2018	2203	4221
2005	526	533	1059	2169	2202	4371

HOUSING REPORT - IMPACT

MUNICIPALITY : 1 GILLETTE

YEAR	SINGLE FAMILY HOUSING	APARTMENTS	MOBILE HOMES	OTHER HOUSING
1981	196	89	0	25
1982	311	143	539	22
1983	453	177	492	7
1984	543	202	149	8
1985	624	222	177	9
1986	719	243	196	9
1987	812	273	210	10
1988	896	303	226	11
1989	962	327	241	12
1990	1004	347	262	17
1995	1092	366	367	31
2000	1144	380	373	27
2005	1205	404	392	44

MUNICIPALITY SCHOOL ENROLLMENTS

MUNICIPALITY: 1 GILLETTE

YEAR	IMPACT STUDENTS PRIMARY	IMPACT STUDENTS SECONDARY	IMPACT STUDENTS TOTAL	ALL STUDENTS PRIMARY	ALL STUDENTS SECONDARY	ALL STUDENTS TOTAL
1981	404	369	773	2576	2314	4890
1982	513	446	959	2675	2305	4980
1983	439	359	798	2607	2196	4803
1984	526	415	941	2735	2273	5008
1985	593	450	1043	3264	2335	5598
1986	651	475	1126	3244	2394	5637
1987	661	515	1176	3178	2471	5649
1988	657	556	1213	3086	2585	5671
1989	664	611	1275	3000	2703	5703
1990	706	710	1416	2763	3168	5931
1995	605	726	1332	2222	2977	5199
2000	372	460	832	1681	2053	3934
2005	496	502	998	2044	2075	4119

WYOMING
FISCAL MODEL

FMODEL RUN NUMBER: 1

FMODEL WAS RUN UNTIL: 2005

RUN DATE IS: 4/16/1983 6:43

COUNTIES INCLUDED IN THIS FMODEL RUN ARE: 1 2 3 4 5

ANNUAL INFLATION RATE:	1.00000
SALES AND USE TAX:	.03710
URANIUM SEVERANCE TAX:	.69000
NATURAL GAS SEVERANCE TAX:	.05500
COAL SEVERANCE TAX:	.87400
TRONA SEVERANCE TAX:	.50900
OIL SEVERANCE TAX:	1.56000

STATE REPORT
(FOR SELECTED COUNTIES)
AGGREGATE FISCAL IMPACTS

	←REVENUES→											
YEAR	SALES AND USE TAX ($000)	MINERAL HIGHWAY FUND ($000)	HIGHWAY TAX ($000)	CIG.-TOB LIQ-BEER TAX ($000)	SPECIAL DISTRICTS FUND ($000)	MINERAL GENERAL FUND ($000)	COAL TAX REVENUE ACCOUNT ($000)	CAP-FACIL REVENUE ACCOUNT ($000)	WATER DEVELOP ACCOUNT ($000)	AGENCY AND TRUST FUND ($000)	TOTAL INCOME ($000)	NET BALANCE ($000)
1981	0	0	0	0	0	0	0	0	0	0	0	-4204
1982	4344	5563	478	86	0	2906	11155	8468	8374	0	41374	34522
1983	5109	5563	575	103	9	2906	11155	8468	8374	0	42262	36206
1984	5044	5563	456	82	17	2906	11155	8468	8374	0	42065	35671
1985	5733	5563	522	94	22	2906	11155	8468	8374	0	42837	35754
1986	6091	5563	563	101	24	2906	11155	8468	8374	0	43245	35729
1987	6269	5563	590	106	28	2906	11155	8468	8374	0	43459	35589
1988	6478	5563	618	111	31	2906	11155	8468	8374	0	43704	35512
1989	6668	5563	642	115	35	2906	11155	8468	8374	0	43926	35272
1990	6964	5563	681	122	39	2906	11155	8468	8374	0	44272	34411
1995	7370	5563	823	148	46	2906	11155	8468	8374	0	44853	34303
2000	7370	5563	768	138	47	2906	11155	8468	8374	0	44789	36332
2005	7370	5563	778	140	50	2906	11155	8468	8374	0	44804	35398

	←EXPENDITURES→								
YEAR	EDUCATION TRANSFERS	SALES+USE TAX TRANSFERS	HIGHWAY FUND	CIGARETTE AND TOBACCO	HIGHWAY OPERATING	GENERAL GOVT. FUNCTIONS	HIGHWAY CON-STRUCTION	TOTAL EXPEND-ITURES	NET BALANCE
	($000)	($000)	($000)	($000)	($000)	($000)	($000)	($000)	($000)
1981	1331	0	0	0	1086	1617	170	4204	-4204
1982	1653	1483	75	38	1293	1926	383	6851	34522
1983	1374	1556	89	45	1007	1499	485	6055	36206
1984	1619	1256	69	35	1145	1705	564	6393	35671
1985	1795	1535	79	40	1221	1818	595	7083	35754
1986	1934	1686	84	43	1267	1886	615	7515	35729
1987	2020	1809	87	45	1314	1956	639	7870	35589
1988	2075	1957	91	46	1350	2010	663	8192	35512
1989	2179	2093	93	48	1422	2117	701	8653	35272
1990	2412	2306	98	50	1599	2380	1017	9862	34411
1995	2251	2652	113	58	1573	2342	1560	10549	34303
2000	1393	2665	96	50	1080	1608	1565	8457	36332
2005	1651	2663	91	48	1346	2004	1603	9406	35398

COUNTY FISCAL IMPACT REPORT

CAMPBELL

YEAR	INCOME: SHARE OF LOCAL PROP. TAX ($000)	INCOME: FEDERAL REVENUE SHARING ($000)	INCOME: HIGHWAY FUND ($000)	INCOME: CIGARETTE AND TOBACCO ($000)	INCOME: OPTIONAL SALES+USE TAX ($000)	INCOME: SALES+USE TAX TRANSFERS ($000)	EXPENDITURES: LAW ENFORCEMENT ($000)	EXPENDITURES: SOCIAL SERVICES ($000)	EXPENDITURES: OTHER GOVT. ($000)	NET FISCAL BALANCE ($000)
1981	0	0	0	0	0	0	19	24	312	-355
1982	2612	0	50	5	19	989	23	29	372	3251
1983	2653	36	60	6	19	1015	18	23	292	3457
1984	2692	36	47	4	16	835	20	26	332	3251
1985	2714	36	54	5	19	1019	22	28	355	3442
1986	2725	36	57	6	21	1118	22	29	368	3543
1987	2740	36	59	6	23	1204	23	30	382	3633
1988	2758	36	62	6	24	1305	24	31	393	3743
1989	2775	36	63	6	26	1398	25	33	414	3833
1990	2791	36	67	7	29	1544	28	37	466	3942
1995	2823	54	77	8	33	1788	28	36	458	4260
2000	2830	54	66	8	33	1810	19	25	315	4442
2005	2845	36	62	8	34	1821	24	31	394	4357

MUNICIPALITY FISCAL IMPACT REPORT

1 GILLETTE

	←INCOME→							←EXPENDITURES→				
YEAR	SHARE OF LOCAL PROP.TAX ($000)	FEDERAL REVENUE SHARING ($000)	USERS FEES ($000)	SPECIAL ASSESS-MENTS ($000)	HIGHWAY FUND ($000)	CIGARETTE AND TOBACCO ($000)	SALES+USE TAX TRANSFERS ($000)	STREET COST ($000)	POLICE AND FIRE ($000)	CITY GOVT. ($000)	DEBT SERVICE ($000)	NET FISCAL IMPACT ($000)
1981	0	0	0	0	0	0	0	30	175	647	1064	-1915
1982	0	0	140	1055	22	31	337	34	202	746	1227	-625
1983	4	21	165	1218	25	35	347	26	151	557	1227	-147
1984	7	21	126	1218	19	26	279	29	173	639	1362	-508
1985	9	21	147	1351	21	30	345	32	186	687	1440	-420
1986	10	21	162	1429	23	33	383	33	194	716	1489	-372
1987	11	21	174	1477	24	34	415	34	202	748	1540	-368
1988	13	21	187	1528	25	36	453	36	209	774	1584	-340
1989	15	21	200	1571	26	37	490	38	223	823	1665	-390
1990	16	21	213	1652	27	39	546	43	255	944	1863	-537
1995	20	30	300	2033	33	48	655	45	262	968	2050	-205
2000	20	30	309	2033	29	41	661	30	178	658	2050	207
2005	22	21	325	961	27	39	662	38	226	837	926	29

SCHOOL FISCAL IMPACT REPORT

MASTER RUN NUMBER : 576 1 1

1 GILLETTE

YEAR	←INCOME→ SHARE OF PROPERTY TAX ($000)	EDUCATION TRANSFERS ($000)	←EXPENDITURES→ DEBT SERVICE ($000)	OPERATING EXPENDITURES ($000)	NET FISCAL BALANCE ($000)
1981	0	0	0	0	0
1982	4668	1247	441	1943	3531
1983	4829	1510	531	2353	3455
1984	4987	1213	531	1891	3777
1985	5070	1439	531	2243	3734
1986	5112	1604	561	2502	3654
1987	5176	1737	600	2710	3603
1988	5251	1822	634	2842	3598
1989	5325	1885	663	2937	3610
1990	5393	1994	706	3106	3575
1995	5538	2280	886	3546	3386
2000	5569	1727	886	2686	3725
2005	5634	1553	354	2417	4415

STATE MINERAL SEVERANCE TAXES
(FOR SELECTED COUNTIES)
IMPACT MINERAL FUND DISTRIBUTION

URANIUM REVENUES

YEAR	GENERAL FUND	MINERAL TRUST FUND	CAPITAL FACILITIES ACCOUNT	TOTAL URANIUM TAX
	($000)	($000)	($000)	($000)
1981	0	0	0	0
1982	125	125	94	345
1983	125	125	94	345
1984	125	125	94	345
1985	125	125	94	345
1986	125	125	94	345
1987	125	125	94	345
1988	125	125	94	345
1989	125	125	94	345
1990	125	125	94	345
1995	125	125	94	345
2000	125	125	94	345
2005	125	125	94	345

COAL REVENUES

YEAR	GENERAL FUND	MINERAL TRUST FUND	COAL TAX REVENUE ACCOUNT	CAPITAL FACILITIES ACCOUNT	WATER DEV-LOPMENT ACCOUNT	HIGHWAY FUND	TOTAL COAL TAX
	($000)	($000)	($000)	($000)	($000)	($000)	($000)
1981	0	0	0	0	0	0	0
1982	11155	13937	11155	8374	8374	5563	58558
1983	11155	13937	11155	8374	8374	5563	58558
1984	11155	13937	11155	8374	8374	5563	58558
1985	11155	13937	11155	8374	8374	5563	58558
1986	11155	13937	11155	8374	8374	5563	58558
1987	11155	13937	11155	8374	8374	5563	58558
1988	11155	13937	11155	8374	8374	5563	58558
1989	11155	13937	11155	8374	8374	5563	58558
1990	11155	13937	11155	8374	8374	5563	58558
1995	11155	13937	11155	8374	8374	5563	58558
2000	11155	13937	11155	8374	8374	5563	58558
2005	11155	13937	11155	8374	8374	5563	58558

MINERAL FUND AND ACCOUNT NOTES

THESE NOTATIONS PERTAIN TO ACCOUNT OR FUND SPECIFIC STIPULATIONS THAT SHOULD BE RECOGNIZED AS IMPORTANT REGULATIONS, DUE TO THE IMPACT SPECIFIC APPLICATION OF THIS MODEL AND A LACK OF DATA RELATING TO ACTUAL OR BASELINE FUND STATUS THE FOLLOWING REGULATIONS ARE NOT PRESENTED IN THIS MODELING ENVIRONMENT.

COAL TAX REVENUE ACCOUNT THESE FUNDS ARE ADMINISTERED BY THE WYOMING FARM BOARD TO FINANCE WATER, SEWER, HIGHWAY, AND ROAD AND STREET PROJECTS IN AREAS DIRECTLY OR INDIRECTLY AFFECTED BY THE PRODUCTION OF COAL, AT LEAST 50 PERCENT OF THIS ACCOUNT IS TO BE ALLOCATED TO FINACE STATE HIGHWAY, COUNTY ROAD, OR CITY STREET PROJECTS, THIS TAX IS DUE TO EXPIRE WHEN CUMULATIVE COL-LECTIONS TOTAL $160 MILLION.

***** CAPITAL FACILITIES REVENUE ACCOUNT ***** THIS ACCOUNT FUNDS THE DESIGN, MAINTANENCE, OPPERATION, REPAIR, AND FINANCING OF STATE GOVERNMENT CAPITAL FACILITIES OPERATIONS, THE TAX LEVY WILL EXPIRE WHEN TAXES COLLECTED TOTAL $250 MILLION.

***** WATER DEVELOPMENT ACCOUNT ***** WHEN THIS ACCOUNT TOTALS $100 MILLION, PROCEEDS ARE DEPOSITED IN THE GENERAL FUND UNTILL THE WATER FUND BALANCE IS REDUCED TO $50 MILLION.

***** HIGHWAY FUND ***** THE LEVY FOR THIS FUND WILL EXPIRE WHEN THE ACCOUNT REACHES $6 MILLION.

PROJECT NUMBER1
DISPLAY OF PROJECT DATA

PROJECT NUMBER	START YEAR FOR CONSTRUCTION	SITE CITY	REGION	PROJECT DESCRIPTOR
1	1981	1	1	CAMPN1 WY01 NORTH CAMPBELL CO COAL EXPANSION

YEARS OF CONSTRUCTION BEFORE OPERATION BEGIN	ACRES OF FARMLAND LOST	ACRES MINED PER YEAR	PRICE OF COAL PER TON	STATE SHARE OF FEDERAL COAL ROYALTIES	TONS MINED PER YEAR	KWH SOLD	SNG SOLD	MINE VALUE
0	0	0	0	0	27,000,000	0	0	230,850,000

PROJECT YEAR	ECONOMIC SECTOR:	FINAL DEMAND VECTORS ($000,000) 7	15	20
1		8154900.00	5880000.00	14035000.00
2		.00	7070000.00	7070000.00
3		.00	9415000.00	9415000.00
4		.00	11760000.00	11760000.00
5		.00	11865000.00	11865000.00
6		.00	12250000.00	12250000.00
7		.00	13125000.00	13125000.00
8		.00	14000000.00	14000000.00
9		.00	15750000.00	15750000.00
10		.00	17500000.00	17500000.00
11-25 (AVG)		.00	18270000.00	18270000.00

DIRECT LABOR (MAN-YEARS)

PROJECT YEARS:	1	2	3	4	5	6	7	8	9	10	11-25(AVG)
CONSTRUCTION	223	0	0	0	0	0	0	0	0	0	0
OPERATION	168	202	269	336	339	350	375	400	450	500	522

OUT-OF-STATE MUNICIPALITY REPORT

136 BROADUS

YEAR	CONSTR	OPER(E)	OPER(NE)	INDIRECT	TOTAL	CHANGE	PERCENT
			IMPACT EMPLOYMENT				
1981	1	0	0	3	4	0	0
1982	1	0	0	3	4	0	0
1983	0	0	0	2	2	-2	-50
1984	0	0	0	2	2	0	0
1985	0	0	0	2	2	0	0
1986	0	0	0	2	2	0	0
1987	0	0	0	2	2	0	0
1988	0	0	0	2	2	0	0
1989	0	0	0	3	3	1	50
1990	0	0	0	3	3	0	0
1995	0	0	0	2	2	-1	-33
2000	0	0	0	2	2	0	0
2005	0	0	0	1	1	-1	-50

137 SPRING CREEK/DECKER

YEAR	CONSTR	OPER(E)	OPER(NE)	INDIRECT	TOTAL	CHANGE	PERCENT
			IMPACT EMPLOYMENT				
1981	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0
1988	0	0	0	0	0	0	0
1989	0	0	0	0	0	0	0
1990	0	0	0	0	0	0	0
1995	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0
2005	0	0	0	0	0	0	0