
CHAPTER 10

Socioeconomic Aspects

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Socioeconomic Aspects

Introduction

An oil shale industry will bring new people into the oil shale region. As a result, the social fabric will be changed in ways both beneficial and detrimental. Growth problems arising from the simultaneous development of oil shale and other energy resources are likely to be more difficult to solve than those from shale development alone.

The 3,200-mi² area where near-term development will take place is rural and sparsely populated. The three counties in Colorado have only one community with over 5,000 residents. Even without expansion of the oil shale industry populations are projected to increase significantly. If a major oil shale industry is created within the next two decades there could be average growth rates of up to 40 percent per year in the early stages of development. Such a rapid population influx would have inevitable social and economic consequences. Among the benefits would be increased employment and expanded community services. Direct employment in the shale industry and the stimulation of support industries and services would increase wages. The larger tax base would permit the counties and municipalities to extend and upgrade their facilities and services. As long as the public and private sectors could keep pace with the growth, most residents probably would welcome it. Among the negative consequences could be a strain on public services and facilities, an increase in crime and other manifestations of social stress, certain private-sector dislocations such as business failures, and in the eyes of some, a deterioration in their quality of life. If these negative outcomes overwhelm the capacity to adjust, a boomtown situation would result, similar to what has happened in other western and plains communities during the rapid development of energy resources,

Time, money, and technical help are needed to ameliorate the detrimental aspects of sudden growth. Communities need time to catch up, particularly if extensive construction of private and public facilities—such as housing and water and sewer systems—is involved. Both Federal and State governments and oil shale developers are providing impact mitigation funds and technical support. To date in Colorado, upwards of \$50 million of public and private funds have been invested in preparations for shale development growth. Programs to administer these resources have been successful, but they have yet to be tested under conditions of sustained rapid growth. Assuming that present plans can be realized in a timely fashion, a total of about 35,000 people could be accommodated in existing communities in the 1985-90 period. Any development that brought more than this number into the area would cause widespread problems unless the growth were carefully timed to the region's ability to accept the new migrants, or plans for additional new communities were quickly implemented.

The maximum growth rate that can be sustained by these communities before boomtown symptoms emerge, and the nature of the appropriate Federal role with regard to social and economic impacts are major issues. The Federal Government now is involved with impact identification, evaluation, and mitigation, but additional activities are controversial. Possible congressional policy options would be to continue present financial support to mitigation programs, to increase efforts to manage growth through regulation, and to expand Federal involvement in mitigation programs, including passage of new legislation directed to energy development in general or to oil shale impacts in particular.

The Setting

Historical Background

Oil shale country covers about 17,000 mi² in the tristate area of Colorado, Utah, and Wyoming. (See ch. 4 for a description of the geography of the region.) Archeological evidence reveals that people probably have lived there for at least 10,000 years. The ancestors of today's Ute Indians arrived at an as yet undetermined time. The Utes were a nomadic people who lived in a few permanent settlements and had many scattered hunting camps. The earliest direct contact between these indigenous people and Europeans was most probably with Spanish explorers, and British and French fur trappers and traders. Trade between the Indians and the Europeans existed from the 1600's onward.

In the late 1700's and early 1800's, contact with Western explorers, traders, hunters, and trappers increased. In 1776, the Escalante-Dominguez expedition passed through the region in search of an overland route to California.² In 1868, John Wesley Powell led a party across Berthoud Pass, into Middle Park, and eventually to the White River valley. A small group wintered at a site near Meeker, Colo., which is now called Powell's Park. The number of people entering the area rapidly increased during the mining boom of the mid-1800's. Settlement was made easier when transportation was improved. The Denver and Rio Grande Western Railroad obtained the route through the Colorado River valley to Salt Lake City. The Colorado Midland and the Denver and Salt Lake City railroads explored the White and Yampa River valleys as alternative routes, although neither was built,

The United States obtained title to the land as part of the Mexican Cession of 1848. From the time of the Cession until the 1880's the United States engaged in a number of treaty negotiations and councils with the Indians.⁴ The treaties ceded the mineral lands to the United States and established reservations for the different bands of Utes. The final

treaty was ratified by Congress in 1880. Under its terms, the White River Utes were given land in Utah in the southern part of the Uintah Indian Reservation to which they were removed in September of 1881. Congress declared the former Ute lands as public domain on June 28, 1882.

While the ownership questions were being debated, squatters appropriated some land illegally. In 1879, when miners founded Carbonate in the Flattops area north of Glenwood Springs, Colo., they displayed their awareness of this by naming their first building Fort Defiance. Coal camps were established west of Glenwood Springs along what came to be known as Coal Ridge Hogback. While silver and gold lured the miners, the rich grasslands attracted cattle and sheep raisers. Large beef herds roamed free; one in 1888 was numbered at 23,000.⁵ The great runs lasted until the turn of the century, when they became uneconomic owing to severe winters combined with overgrazing.

Ranching, mining, and recreation became the economic cornerstones of the region. Although no great precious metal strikes were made, coal mining formed a stable industry for many decades. Coal was produced for the railroads and for the steel mills of Pueblo, Colo. (See ch. 4 for the history of oil shale and related mineral exploration.) Farms and ranches were established as homesteading flourished. Hay production in the valleys became profitable, especially with the advent of irrigation. The visits of Theodore Roosevelt to the Flattops area in the early 1900's, with their attendant publicity, gave impetus to tourism. Communities grew, with Rifle, Meeker, and Rangely, Colo., as centers of trade. The town of Meeker was incorporated in 1885. A trading post was built at the location of Rangely in the early 1880's. Oil was discovered nearby in the early 1900's and production began in the early 1920's. Smaller communities sprang up along the valleys. West of Rifle, the town of De Beque was incorporated in 1890. Grand Valley, founded in

1882, soon became a farming center. To the east of Rifle, New Castle was the hub of the coal communities. Many of the residents today are descendants of the early settlers, Oil shale country, therefore, is an area with stable communities populated by many long-established families.

The Oil Shale Country Today

Agriculture, mining, and recreation have continued as the main economic activities.^z Livestock grazing is the leading agricultural use, followed by dry land farming, and irrigated cropland production. Hay and winter wheat are major crops. The best irrigated land is in Mesa County, Colo., outside the immediate oil shale area, where orchards have long been established. Mineral resource production, mostly oil and gas, and recently coal, constitutes the major mining activity. Tourism, fishing, and hunting have long been the mainstays of the recreational sector, and with the expansion of winter sports areas in the mountains, year-round recreation has become important. In recent decades, trade, manufacturing, and construction industries have grown, along with public and private services. Economic indices, such as retail sales and per capita and family income, have reflected a steady economic growth.^a

The oil shale region encompasses about eight counties. (See figure 69.) In Colorado, these are Rio Blanco, Garfield, and Mesa; some social and economic effects from expanded oil shale development may also be felt in Moffat County, north of the Piceance basin. The counties in Utah that will be affected are Uintah, Daggett, Grand, and Duchesne. The tricounty area of Colorado covers 9,563 mi², has a limited transportation system, and includes about a dozen communities that could be affected by oil shale industry expansion, (See figure 70.)

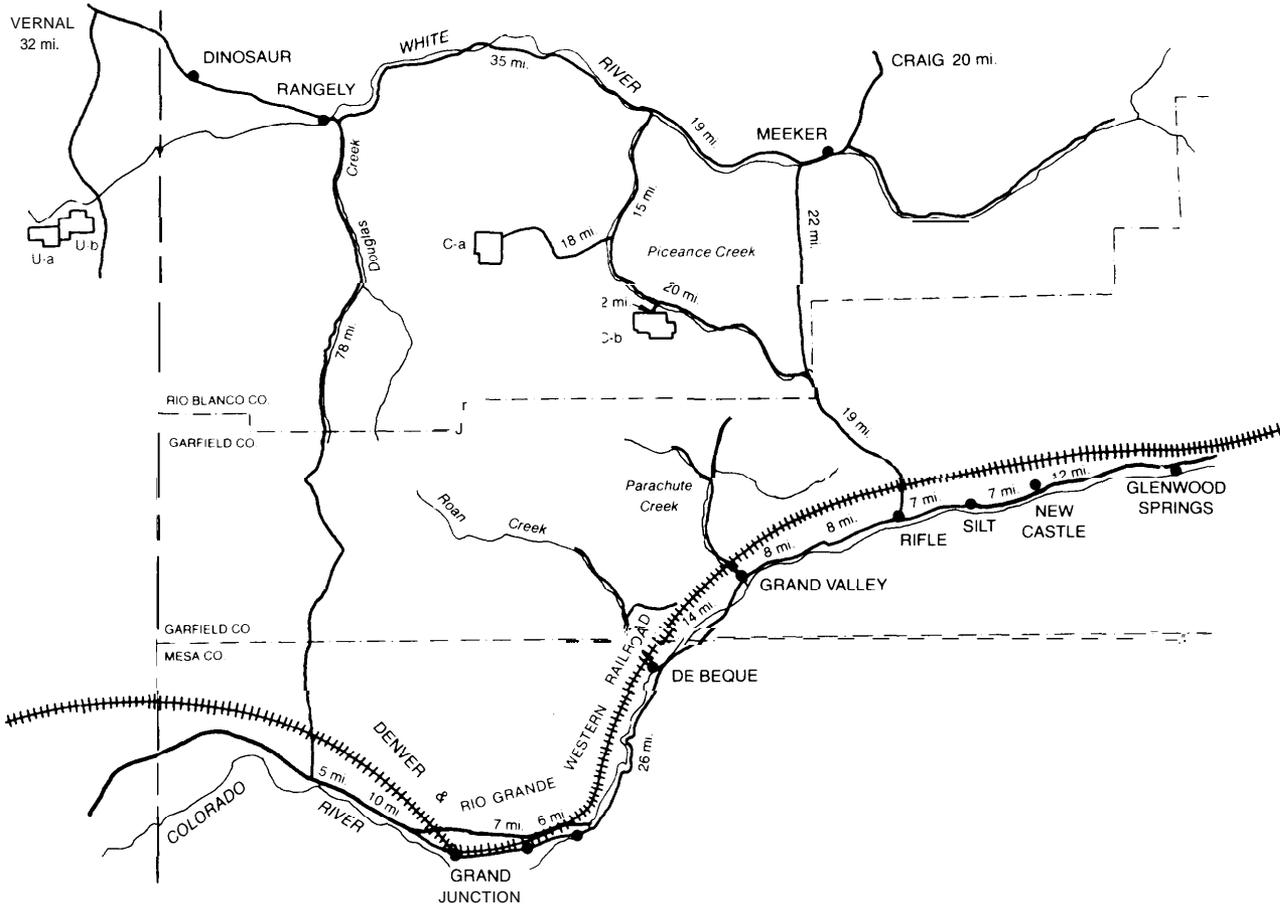
Stretching along the southern edge of oil shale territory, Mesa County is the transportation and service center for the western slope of Colorado. Grand Junction, the largest city of the region, is the site for the offices of

several energy companies. Interstate 70 (segments of which are not yet completed) extends eastward up the valley of the Colorado River and westward into Utah; it is 260 highway miles to Denver and 285 to Salt Lake City. The only airport on the western slope able to accommodate commercial jets is in Grand Junction. The Denver and Rio Grande Western Railroad also has extensive facilities there.

Garfield County lies adjacent to Mesa County on the north. It encompasses the Roan Cliffs along the southern border of the Roan Plateau, and is the site of most of the private oil shale holdings. The Colorado River flows through the eastern part of the county, and transportation is readily available along this corridor. Glenwood Springs, the county seat, is located in the eastern portion. Rifle, Grand Valley, Silt, and New Castle are communities affected by the present modest scale of oil shale development. Rifle is the home of many oil shale workers from tracts C-a and C-b. A vanadium plant is located nearby, and coal development activities have recently increased along the valley. The Naval Oil Shale Reserve at Anvil Points lies between Rifle and Grand Valley. If present trends continue, the Rifle vicinity will experience the most growth.

Rio Blanco is the county most likely to experience the major effects of expanded oil shale development. Lying between Garfield and Moffat Counties, it is where the richest oil shale deposits in the United States are located. Most of these are on Federal lands in the Piceance basin. Rio Blanco is the least populated of the three, and has the most limited surface transportation. The White River flows along the northern part; the two major communities, Meeker (the county seat) and Rangely, lie within the river valley. Rangely is a center for oil and gas development activities. The primary north-south highway goes from Rifle through Meeker and Craig and then on to Wyoming. The main east-west road goes from Meeker to Rangely, before turning north to Dinosaur, where it passes into Utah. A State highway goes south from Rangely through Garfield County and eventually to

Figure 70.—Communities in the Colorado Oil Shale Region



SOURCE Oil Shale Tract C-b Socio Economic Assessment 76 VOL II

southwestern corner of the county, could be directly affected. It has already grown from oil and gas exploration, and oil shale activities in Utah as well as the Piceance basin could further accelerate its growth.

In sum, the oil shale region of Colorado, Utah, and Wyoming is a large area with a small population. Most of the residents are found in widely separated communities that are linked by a few highways. Before the recent increase in energy-related industrial activity, the main economic base was ranching and farming, supplemented by tourism, recreation, and mining. A large number of new residents have migrated to Moffat County, to the north of the oil shale region. The fastest

growth from expansion of the shale industry will most likely take place in the least populated county, Rio Blanco, which contains the richest oil shale deposits. Garfield County is apt to experience major impacts from its growth.

Early Planning for Oil Shale Development

Concern about the social and economic effects on Colorado communities of large-scale oil shale development was expressed in the late 1960's.⁹ As a result, planning activities began in the early 1970's. The environmental impact statement (EIS) filed in conjunction with the Prototype Leasing Program examined some social and economic elements.

However, its lack of detail prompted industry to take the initiative to undertake additional analysis. In 1972, an Oil Shale Regional Planning Commission was formed, which took an inventory of the area and of shale technologies. Contracts with consulting firms produced several planning documents. ” The responsibilities of the Commission were assumed later by the Colorado West Area Council of Governments (CWACOG). An awareness of the need to prepare for growth prompted these early planning efforts, but as work proceeded, an atmosphere of uncertainty arose. When the lessees requested suspensions, expansion of the oil shale industry became questionable in the minds of many who were charged with the responsibility of preparing for its consequences. ”

Local programs to minimize possible adverse affects were begun after the leasing of tracts C-a and C-b. The C-a lessees, Rio Blanco Oil Shale Co. (Gulf Oil and the Standard Oil Co.—Indiana), prepared an impact analysis for their operation. ’2 They hired a consultant, the Foundation for Urban and Neighborhood Development (FUND), to survey community attitudes toward energy development in Rangely, Meeker, and Rifle. The lessees also engaged a planning firm, the Gulf Oil Real Estate Development Co. (GOREDco), that—with the participation and direction of the community—prepared a comprehensive development plan for Rangely. The master plan was completed in 1976 and subsequently adopted by the town, certified to the county, and incorporated in the county plan. Through FUND an attorney was engaged to update and codify Rangely’s municipal ordinances. The lessees also contributed to the improvement of the county road leading to tract C-a, and paid for the design and preparation of cost estimates for a 22-mile extension from the tract more directly to Rangely.

In 1976, the lessees of the C-b tract (at that time consisting of Ashland, Atlantic Richfield, Shell, and Tosco) published a baseline description and an impact analysis study. ’3 Like the tract C-a lessees, they hired a consulting firm, Quality Development Associates (QDA),

to prepare socioeconomic monitoring reports and to work with local citizens on strategies for managing growth. The lessees were also members of a private development, the Colony project. Several socioeconomic reports were prepared as part of this joint effort,¹⁴ and, under the direction of Atlantic Richfield, early plans were prepared for Battlement Mesa, a proposed new town to accommodate workers from the Colony project. ’5

The tracts C-a and C-b lessees each contributed \$40,000 to help establish the Rio Blanco County Planning Department. The money was used to prepare a comprehensive plan that was adopted and certified to the communities in the latter part of 1976. Both groups of lessees funded development of a growth-monitoring model by CWACOG, and the original tract C-b partners and one of the C-a partners participated in the preparation of a tax study. Planning was also underway in Utah between 1970 and 1975. For example, in 1975 a socioeconomic analysis was published by the White River Shale project that dealt with the effects of the proposed development of a 100,000-bbl/d industry in Utah. ¹⁶

The value of the early studies varied because each had a different emphasis, coverage, and set of basic assumptions. Comparing the multipliers used to derive projected growth illustrates these differences. To obtain an estimate of new employment fostered by a project (local service employment), the expected work force for the project (basic employment) is multiplied by some factor (multiplier). Table 87 compares the multipli-

Table 87.—Comparison of Basic to Local Service Employment Multipliers

Illustrative study ^a	Multipliers used	
	Construction phase	Operating phase
1. Prototype EIS.	63	77
2. C-a (Rio Blanco) Social & Economic Statement	5	5
3. C-b Soclo-Economic Assessment	5 to 10	15
4. Colony EIS.	.29	97
5. Uinta Basin Study	3 to 10	10 to 1.5

^aSee ref 17 for full title of the studies

SOURCE Office of Technology Assessment

ers used in five of the early studies,¹⁷ These vary so much that a single increment of employment can result in a twofold to threefold difference in the projected populations. (The five studies are compared in greater detail in tables 88 and 89.)

The differences occurred for several reasons. In the EISs, socioeconomic factors received little emphasis because at that time they were not considered—as is now the case—essential to environmental impact analysis. In general, the EISS assumed that existing

Table 88.—Baseline Data—Selected Social and Economic Studies (each dot indicates the inclusion in the study of this category of data)

Data categories ^a	Title of study ^b				
	Prototype EIS	C-a social and economic	C-b socioeconomic	Colony EIS	Uinta Basin
Existing economic/demographic data					
Population and employment					
County population	•	•	•	•	•
Number of households by county	•		•	•	•
Number of households by community			•		
Labor participation by county	•	•	•	•	•
Education					
Enrollment by county	•				
Enrollment by school district			•	•	
Enrollment by city		•			
Student/teacher ratio		•	•		•
Median school years attained	•	•		•	•
Dropout/turnover rates			•		
Employment by industry					
Total employed-sector by county	•	•	•		•
Total employed-sector by city					
Total employed-sector by region				•	•
Employment—other energy Industry					
Family/Individual Income Indicators					
Median family Income by county	•		•	•	•
Per capita Income by county		•			•
Unemployment rate by county	•	•	•		•
Poverty status by county			•	•	•
Rate of population growth					
By county and community		•	•	•	
Projected without 011 shale			•	•	•
Existing public services/facilities					
Education					
Age of school buildings by district			•		
Certified staff			•		
Excess pupil capacity			•		•
Public safety					
Fire/police protection by area			•		•
Manpower/number of vehicles			•		•
Water					
Estimated depletion (1970) by region ..	•				
Status of projects by State	•			•	
Source, storage capacity, number of taps per population served by community		•	•		
Status of water rights					•
Wastewater and solid waste disposal					
Treatment facilities by community type/population served/design capacity	•	•	•		•
Transportation					
Existing roads/airports by county	•			•	•
Status of current projects			•		
Average weekday traffic counts			•		
Health					
Facilities/manpower by county	•	•	•	•	•
Mental health facilities			•	•	
Recreation and land use					
Resource Inventory	•				

Table 88.—Baseline Data—Selected Social and Economic Studies —continued

Data categories ^a	Title of study ^b				
	Prototype	C-a social EIS and economic	C-b socioeconomic	Colony EIS	Uinta Basin
Recreational facilities by type					•
Land by ownership by county	•				•
Agricultural land by county	•				•
Government structure/fiscal information					
County/municipal government finance					
Revenues and expenditures by county	•		•	•	•
Municipal revenues and expenditures			•	•	•
Property tax valuation, average mill levy, and total levy by county			•	•	•
Distribution of levy revenues by county			•		•
Sales tax information			•		•
Retail trade information			•		•
School district finances					
Total expenditures by county	•				
Total and per capita expenditures by districts					•
Comparison of per pupil expenditures and mill levies by districts					
Mill levy by fund, assessed value revenue by source, by district					
Bonding principal and remaining capacity					
Housing					
Inventory and costs					
Estimated housing by county		•		•	•
Status of available units by type		•		•	•
Value of owner-occupied units				•	•
Value of other units					
Projected needs by tenure by county					
Characteristics by type by city					•
Public opinion					
Local opinion regarding					
Socioeconomic environment and quality of life			•	•	
Attitudes about changes in quality of life and society		•	•	•	•
Attitudes about perceived advantages/disadvantages of O11 shale development		•	•	•	•

^aData categories are for illustration. No attempt has been made to include all of the information in these studies.

^bSee ref 7 for listing of full title.

SOURCE: Office of Technology Assessment

mechanisms could deal with most consequences of growth. When it became apparent they could not, subsequent studies went into greater detail about the effects of the expected growth and possible remedial actions. Not all of the studies, however, included the same types of information. For example, community facilities and local government data

were not made a part of the C-a analyses because they were in the Rangely master plan. Little attention was paid in any of the studies to other resource development projects anticipated or underway in the region. As a result, all of them are deficient in analyzing the cumulative effects of industrial expansion.

Mechanisms to Manage Growth

Local Infrastructures

In Colorado, Garfield, Rio Blanco, and Mesa Counties all have planning councils, professional planning staffs, and approved countywide comprehensive plans. Meeker,

Rangely, Rifle, and Grand Junction have full-time city managers, and Grand Junction and Rifle have city planners. Rio Blanco County has adopted an ordinance applying to land use that, in certain circumstances, requires filing an impact analysis statement specifying

Table 89.—Impact Data—Selected Social and Economic Studies (each dot indicates the inclusion in the study of this category of data)

Impact categories ^a	Title of study ^b					
	Prototype	EIS	C-a social and economic	C-b socioeconomic	Colony EIS	Uinta Basin
Population/employment projections						
Total basic population projections	•	•	•	•	•	•
Project-related employment projection ^c	•	•	•	•	•	•
Estimated family size for construction and service populations	•	•	•	•	•	•
Timelag included for local service employment forecasts				•	•	•
Estimation of community choice for residence and allocation of population			•	•	•	•
Community facilities/services projections						
Education						
Site and plant costs, personnel needs, salary requirements					•	
Projected numbers of pupils and room requirements.				•		•
Projected increase in demand for teachers and classrooms						•
Public safety						
Fire and police needs and costs				•	•	
Cumulative impact on facilities and personnel						•
Water						
Expected needs by technology	•					
Needed improvements and estimated costs—municipal system				•		
Projected site, plant, personnel, and salary requirements					•	
Capacity and expansion by towns, depletion by sector by region						•
Solid waste disposal and wastewater				•	•	•
Transportation				•	•	
H e a l t h				•		•
Mental health				•		•
Recreation						
Land loss by State by technology	•					
Projected open space and recreational needs and costs				•		
New sites and facilities needed (project development area)						•
Local government fiscal need projections						
School district financing needs				•		
County and municipal government finances						
Estimated Federal, State and local revenues by tax source by State	•					
Projected total revenues and expenditures, by tax source/per capita				•		•
Facility and personnel costs, valuation and taxes levied					•	
Impact by development pattern or project phase				•		•
Housing						
Projected housing requirements						
Types needed by development phase				•	•	
Demand by community.....				•		•
Land use requirements by units per acre, total units, and type					•	
Public construction expenditures and tax receipts by State	•					
Recent construction by communities				•		

^aImpact categories are for all studies. No attempt has been made to include all of the information available in these studies.
^bSee ref. 17 for a listing of full titles.

^cSee text for a discussion of the differences in the projections as a function of the multipliers used in each study.
^dSee text for an explanation of the lack of information for the C-a social and economic study column.

SOURCE: Office of Technology Assessment

actions that will be taken to alleviate any adverse effects of changes in land use.¹⁸

In the early planning stages, special groups were created in Rio Blanco and Mesa Counties and the Rifle area. The most active, called the Impact Mitigation Task Force, is in Rio Blanco County. It was initiated following a series of informal meetings between indus-

try representatives, their consultants, and county officials, and consists of about 30 members organized into a core group and two advisory panels. The core group, which meets monthly, is composed of the county commissioners; the city manager and mayor from the two municipalities, Rangely and Meeker; and representatives from industry, the Federal and State governments, and CWACOG. It has



Photo credit OTA staff

Monthly meeting of the Rio Blanco County Impact Mitigation Task Force

been officially designated to serve in an advisory capacity to the county commissioners. One advisory panel represents Meeker and the eastern part of the county, the other Rangely and the western portion. Many different interests are reflected, including agencies such as the sanitation district and the public schools, and less formally organized groups such as youth. The advisory panels, which also meet once a month, discuss different growth-related topics, and forward their concerns to the core group. They have prepared needs assessments on a variety of general subjects and have reviewed specific issues such as housing for teachers.

The Rifle area organization was formed in mid-1977 with a core group and series of working panels. When first established, it was called the Development Impact Committee, and consisted mainly of Rifle residents. A county commissioner from the area was a member but countywide communication was not extensive. Most of the development and planning management activities were carried

out through the Rifle planning and administrator's offices. In the fall of 1979, the organization was enlarged to involve other communities along the Colorado River valley. The core group was broadened to include all of the county commissioners and representatives from each of six towns. To advise the core group, a West Garfield Impact Committee was created composed of 19 voting members chosen to represent a wide range of interests. The Impact Committee will undertake planning activities and recommend to the core group which projects they support for submission to the State for funding assistance. Prior to the establishment of this process, requests were made through the cities directly to the county commissioners.

In December 1977, Mesa County organized an Impact Assistance Team. Fifteen members, representing local, State, and industry interests, review funding requests made to the county commissioners. Applicants must provide information to the team justifying their requests. Responsibility for setting priorities rests with the commissioners.

The Functions of the Local Planning Processes

The work of the special groups has centered around three areas: physical planning and development, information generation and transfer, and screening and placing priorities on requests for funding. As an illustration of the first function, the Rio Blanco advisory and core groups, using population forecasts provided by CWACOG, have reviewed the ability of local public facilities, such as sewer and water systems, to handle larger loads, and have helped plan expansions where appropriate. Needs for housing, schools, recreational facilities, and downtown redevelopment have also been considered. Each planning group has struggled with the implications of comprehensive land planning for its region.

Because energy development often involves uncertainties about factors such as the timing of construction and the size of work forces, obtaining accurate information is important to officials and residents. The best estimates available are required and, in this regard, most groups receive frequent updates from industry representatives about the status of their projects. Sharing information also involves communication between local officials and citizens. The advisory groups provide a public forum for the presentation, analysis, and discussion of issues, which allows individuals to help determine future growth patterns. The core groups, especially when screening requests for impact mitigation funds, help establish a consensus among local interests on priorities and policies.

An important function of each group is recommending to their respective county commissioners which project applications should be forwarded to the Federal and State governments for consideration for funding. The Rio Blanco County structure is unique in this respect. The involvement of the task force core group and advisory panel members with local officials, industry representatives, consultants, CWACOG, State legislative and executive staff, and Federal agency personnel broadly allocates responsibility for decisions. Having the task force place priorities on ap-

plications for financial assistance validates the process and formalizes the responsibility.

This consideration of the functions of Colorado's local planning mechanisms illustrates several general questions related to socioeconomic effects. Among them are:

- Ž Who identifies the consequences of growth?
- Who judges whether these are positive or negative?
- Who determines which ones require redress?

Local entities address all three questions in the model presently operating in Colorado. In some instances, these are established governmental units, such as planning offices; in others, unique panels with broad community representation. The latter arrangement has several advantages. It allows individuals close to the communities to judge the balance between positive and negative impacts, and provides an opportunity for citizens with different interests to propose solutions to local problems. Many share the responsibility of deciding which difficulties are severe enough to require assistance beyond that available from local resources. The assumption underlying the model is that those affected should have the prerogative of deciding what a negative impact is and how it might be ameliorated.

Private Sector Contributions

Throughout the West, energy development industries are contributing significantly to growth management.¹⁹ As previously noted, several oil shale developers have voluntarily contributed to projects in communities affected by their activities. The Rio Blanco Oil Shale Co., for example, spent over \$700,000 in direct grants and purchases of services to assist the Rangely area and over \$135,000 in support of Rio Blanco County. The Colony Development Operation invested about \$3 million to acquire land and plan for the new town of Battlement Mesa. Industry has also adopted programs to deal with particular

problems. To reduce traffic and contribute to highway safety, the tract C-b lessees operate buses for their workers from Rifle to the tract. They have also provided financial as-

sistance to real estate developers for construction of apartment units in Rifle and Meeker, and for a mobile home park in Rifle.²⁰



Photo credit OTA staff

Apartment units in Rifle, Colo., developed with industry assistance

State Programs

Colorado

Colorado's programs largely involve financial and technical assistance. Financial support is directed to municipal, county, and private agencies with money obtained from two main sources, lease revenues collected by the Federal Government and severance taxes collected by the State. Technical assistance is in the form of information gathering and dissemination, advisory services, program coordination, and similar support activities.

AGENCIES INVOLVED IN MITIGATION PROGRAMS

Two State governmental groups are involved in Colorado's programs for impact mitigation: the Division of Energy and Mineral Impact in the Department of Local Affairs (DLA) and the Joint Budget Committee (JBC) of the General Assembly.

JBC is a legislative committee composed of members from both houses of the Colorado General Assembly. It is responsible for drafting the State budget and forwarding it to the Assembly for final action. In 1974, the General Assembly created the State Oil Shale

Coordinator's Office,²¹ which subsequently evolved into the Governor's Socio-Economic Impact Office (SEIO). SEIO, the lead agency for coordination within the State government, is now the Division of Energy and Mineral Impact in DLA. The Division reviews requests for Oil Shale Trust Fund assistance (described below), and recommends projects for funding to JBC. It is also responsible for contract negotiations and for administering appropriations. The Division also handles mitigation programs for communities experiencing boomtown impacts from other types of development. DLA coordinates State and local mechanisms in several ways:

- reliance on local and regional groups to take an advocacy role in presenting local needs to State agencies,
- review of requests by State-level agencies involved with or that might be affected by mitigation projects, and
- administration of appropriations and contracts through field representatives in concert with local officials and contractors.

Financial Assistance.—

Federal Revenues.—Under the provisions of the Mineral Leasing Act of 1920, as amended,²² each State receives 50 percent of the proceeds from the sale or lease by the Federal Government of public lands within the State. Colorado has created two distinct funds to receive these revenues: one for those returned from oil shale lands and another for those returned from lands other than oil shale. The former is called the Oil Shale Trust Fund and the Oil Shale Interest Earned Fund; the latter is the Colorado Mineral Leasing Fund.

- **Oil Shale Trust Fund and Interest Earned Fund.** Colorado's Oil Shale Trust Fund²³ was created in 1974 to receive those revenues specifically coming from lease payments, royalties, and bonuses on the two Federal oil shale tracts in western Colorado. To date, the Oil Shale Trust Fund has received payments corresponding to the first three bonus pay-

ments paid to the Federal Government by the tract lessees. Under the bonus offset provision of the Prototype Leasing Program, expenditures for certain development work on the lease tracts can be credited against the final two payments. Since the lessees have proceeded with development, it is likely that 100 percent of the final two bonus payments will be offset, and that, therefore, neither the State nor the Federal Government will receive any additional lease payments in cash. (See table 90 for a summary of the Fund's revenues.)

The State statute creating the fund specifies that the income shall be disbursed as follows:

... for appropriation by the General Assembly to state agencies, school districts, and political subdivisions of the state affected by the development and production of energy resources from oil shale lands primarily for use by such entities in planning for and providing facilities and services necessitated by such development and production and secondarily for other state purposes.²⁴

The Oil Shale Trust Fund is not technically a trust since there is no statutory requirement that the principal be kept intact. However, JBC has maintained the principal at approximately \$60 million,

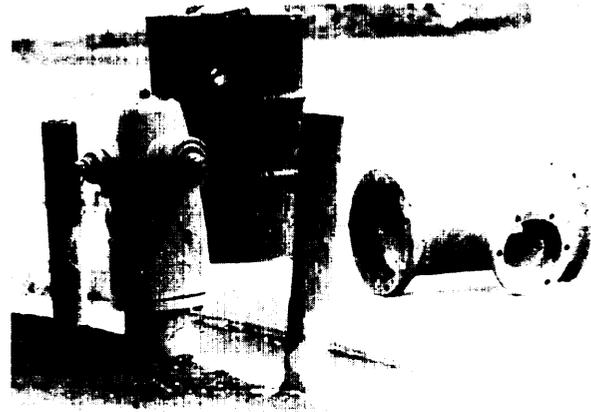


Photo credit: OTA staff

Upgrading of facilities in Rangely, Colo., utilizing Oil Shale Trust Fund monies

Table 90.—Revenues of the Colorado Oil Shale Trust Fund, Fiscal Years 1975-79

Year	Lease/bonus income ^c	Interest earned	Total annual income
F Y 1 9 7 5 ^a	\$24,607,020	0	\$24,607,020
F Y 1 9 7 6 ^b	24,607,020	\$2,685,600	27,292,620
FY1977 ^c	24,607,020	3,811,271	28,418,291
FY1978 ^b	0	4,219,970	4,219,970
F Y 1 9 7 9 ^b	0	5,999,918	5,999,918

^aSee text for discussion of offsetting provisions applying to 1978/79

^bSummary and Status Report of the Mineral Lease and Severance Tax Fund, Second Annual Report to the Colorado State Legislature Department of Local Affairs 1979

^cState treasurer's office

SOURCE: Office of Technology Assessment

and appropriations have been made only from interest earnings and from the principal in excess of \$60 million. The interest earned by the State is set aside as the Oil Shale Interest Earned Fund, a special account established in 1975.²⁵ Loans as well as grants from the interest fund are permitted; the authorized purposes for appropriation of the interest earnings are identical to those of the principal fund. (See table 91 for a summary of expenditures.)

- Colorado Mineral Leasing Fund. Colorado's share of public land monies collected by the Federal Government for leasing of minerals other than oil shale is placed in the Colorado Mineral Leasing Fund.²⁶ The fund was created in 1977 to be used for planning, construction, and maintenance of public facilities, and the provision of public services. Priority is to be given to "those . . . political subdivisions socially or economically impacted

Table 91.—Expenditures of the Colorado Oil Shale Trust Fund, Fiscal Years 1975-80

Year	Amount of appropriation	Amount expended	Outstanding commitments
F Y 1 9 7 5 ^a	\$ 451,187	\$325,926 ^b	0
F Y 1 9 7 6 ^a	10,385,300	10,029,381	\$ 2,000
FY 1977 ^c	4,239,646	3,283,408	47,332
FY 1978 ^a	6,464,793	4,702,737	993,510
FY 1979 ^a	8,929,090	6,306,940	2,622,150
FY1980 ^c	10,446,102	Not available	Not available

^aSummary and Status Report of the Mineral Lease and Severance Tax Fund, Second Annual Report to the Colorado State Legislature Department of Local Affairs 1979

^b\$125,261 of the \$451,187 original appropriation was returned to the Oil Shale Trust Fund

^cDepartment of Local Affairs Division of Energy and Mined Impact

SOURCE: Office of Technology Assessment

by the development, processing, or energy conversion of minerals" that are leased from the Federal Government and/or that are subject to State severance taxation.²⁷ The State statute provides for an automatic distribution of the monies to the public schools, to the counties where the leased lands are located (except that no county can receive more than \$200,000 in any calendar year), to the Colorado Water Conservation Board Construction Fund, and to the Local Government Mineral Impact Fund.

State revenues.—In 1977 Colorado levied a severance tax on the production and export of metallic minerals, molybdenum ore, oil and gas, coal, and shale oil.²⁸ Proceeds are allocated to different accounts according to the mineral being taxed. To date, most of the income has been derived from oil and gas, molybdenum, and coal. Two new funds were established at the time of passage of the severance tax: a State Severance Tax Trust Fund and a Local Government Severance Tax Fund. When shale oil revenues are realized, they will be distributed as follows:

- 40 percent to the State General Fund, 40 percent to the State Severance Tax Trust Fund, and
- 20 percent to the Local Government Severance Tax Fund.

Although separate legislation created the Local Government Mineral Impact Fund and the Local Government Severance Tax Fund, for practical purposes they have been combined into an Energy Impact Assistance Fund that is administered by the Division of Mineral and Energy Impact.

Mechanisms for Disbursement.—

The Colorado General Assembly makes appropriations from the oil shale principal and interest funds based on the recommendations of JBC. Requests for financial assistance from the oil shale funds are initiated at the local level. Priorities for needs are assigned at the local level and forwarded to JBC. In addition, the requests are reviewed by the Division of Mineral and Energy Impact. JBC receives the

requests in public hearings and subsequently corresponds with local officials if clarification is needed. After analyzing the requests, JBC incorporates, as a series of line items in the appropriations bill, the sums recommended for expenditure from the oil shale funds. (See tables 92 and 93 for a listing of the general categories under which these monies have been expended and the projects that have been funded.)

In contrast to the legislative process controlling the oil shale monies, disbursements from the Energy Impact Assistance portion of the Mineral Leasing Fund are at the discretion of the executive director of DLA. Obligations are made by contracts negotiated and administered by field representatives from the Department. DLA uses the same local and regional review process followed in the oil shale appropriations procedure for the identification of needs and the ranking of funding requests. It is assisted by a statewide energy impact assistance advisory committee that makes recommendations to the executive director of DLA.

Technical Assistance.—

Information gathering and dissemination, program coordination, regional planning, and advisory services are the main types of technical assistance provided to local planners. For the oil shale region, this assistance comes from CWACOG and DLA.

Table 92.—Appropriations From the Oil Shale Funds by Object, Fiscal Years 1975-80

Purpose	Amount appropriated FY 1975-80 ^a	Percent of total appropriation
Road, bridge, and drainage	\$14,298,736	35.1
S c h o o l s	9,262,714	22.7
Water	9,402,403	23.0
Sewer	2,802,058	6.9
Health and mental health	440,668	1.1
Municipal facilities	3,013,500	7.4
Recreation	370,000	0.9
Coordination and planning	1,190,788	2.9
T o t a l	\$40,780,867	100.0

^aSummary and Status Report of the Mineral Lease and Severance Tax Fund Second Annual Report to the Colorado State Legislature Department of Local Affairs 1979
^bState Appropriation Act for FY 1979-80 IS B 5251

SOURCE Office of Technology Assessment

Colorado West Area Council of Governments.—CWACOG is a clearinghouse for the municipalities and counties of northwestern Colorado. With respect to energy development, it provides communities with information about industry plans and government assistance programs, and makes local groups aware of the responses of neighboring jurisdictions to impact problems. It also assists the mitigation task forces in preparing their needs assessments and in assigning priorities to the final requests submitted to the State; and it is the central agency through which grant applications to both State and Federal agencies must pass.

CWACOG uses a growth-monitoring system to project future employment and total population figures. Industry work force information and economic and demographic multipliers are combined for these forecasts. The computer model can accommodate updated information, and can supply outputs such as projections based on alternative assumptions and growth scenarios. The system provides a single source of data for government and industry officials.

Field Representatives for DLA.—Field personnel are located in several areas of Colorado that are experiencing energy-related growth. They help organize community mitigation teams and coordinate local, county, and regional requests for funding assistance. They also negotiate and administer contracts involving the expenditure of impact funds. They serve a valuable function by expediting State funding, advising local officials about current assistance programs, and monitoring the progress of authorized work.

Utah

Between 1970 and 1977, the population of Utah increased by 20 percent. Unlike other Western States, however, most of this growth was from a high birth rate, with immigration accounting for only 4 percent of the increase. Although there has not been a large migration to the State as a whole, energy development

Table 93.—Projects Funded by the Colorado Oil Shale Trust Fund, 1975-80

FY 1975		FY 1976		FY 1977	
Recipient	Amount	Recipient	Amount	Recipient	Amount
Mesa County schools (Re-51)	\$42,575	Water Construction fund (Colorado Water Board)	\$2700,000	Piceance Creek Road	\$2,135,000
Moffat County schools (Re-1)		Piceance Creek Road	1,873,091	Roan Creek Road	665,858
Garfield County schools (Re-2)	12,389	Rio Blanco County schools (Re-1)	1,189,000	Rangely sewer	460,000
Rio Blanco County planning	10,000	Garfield County schools (Re-2)	1,000,000	Craig Hospital	230,000
Garfield County planning	10,000	Moffat County schools (Re-1)	670,000	Craig water tank	215,000
Mesa County planning	10,000	Bonanza Road	497,909	Mesa County schools (Re-49)	147,000
Garfield County schools (Re-1)	8,000	Rulison Bridge	471,000	011 Shale Coordinator's Off Ice	106,000
Mesa County schools (Re-49JT)	7,260	Roan Creek Road	467,595	Garfield County planning	100,000
Meeker schools	4,000	Mesa County schools (Re-51)	400,000	Moffat school leases	51,456
Colorado West Area Council of Gov'ts	781	De Beque Bridge	299,658	Mental health services	34,000
Office of the Governor		Garfield County schools (Re-1)	200,000	Hayden school site	25,000
Administration	87,187	Colorado West Area Council of Gov'ts. (technical assistance)	200,000	Colorado West Area Council of Gov'ts	25,000
State Impact Report	92,734	Garfield County schools (Re-16)	121,057	Delta County	17,000
		Routt County Road	100,000	De Beque sewer	15,000
		Oil Shale Coordinator's Off Ice	100,000	New Castle sewer planning	6,666
		Town of Hayden, streets	50,000	Silt sewer planning	6,666
		Mesa County schools (Re-49)	36,000		
		Rio Blanco County schools (Re-4)	10,000		
FY 1978		FY 1979		FY 1980	
Recipient	Amount	Recipient	Amount	Recipient	Amount
De Beque water	\$608,000	Rifle water	2,056,000	Rifle school construction	\$2,750,220
Grand Valley Bridge	532,125	County Road 24	1,000,000	Rifle bypass	2,000,000
Rangely streets	500,000	Rangely streets	900,000	Meeker sewage treatment expansion	1,440,000
Carbondale sewer	479,000	Craig High School	750,000	Silt water Improvements	1,400,000
Moffat County–Sunset School	450,000	Colorado Water Conservation Board	600,000	Meeker streets and drainage	800,000
Hayden Elementary School	450,000	Rifle bypass	500,000	Mesa County sewer system Improvements	796,787
Rifle sewer	438,750	Meeker sanitation	368,000	C-a to Rangely Road engineering	300,000
Meeker streets	435,400	Meeker pool	350,000	De Beque water system	300,000
Mesa County schools (Re-51)	350,000	Meeker streets	320,000	Rifle senior center	172,500
Hayden water	280,000	Mesa County airport water	293,250	Grand Valley sewage treatment plant	141,206
Craig City Hall	275,000	Garfield County airport	260,000	Dinosaur water system	66,153
Garfield County schools (Re-2)	273,757	Grand Valley water	250,000		
Moffat County bypass	250,000	Fruita sewer	200,000		
Roan Creek Road	135,000	Transportation planning, CWACOG	198,000		
Craig water	125,000	New Castle water	196,000		
Oak Creek water	122,000	Silt water	151,000		
Oil Shale Coordinator's Office	114,079	Impact Coordinator's Office	114,079		
Rangely sewer	100,000	Colorado Northwest Community College	110,000		
Mental health center	95,857	Mesa County sewer	104,450		
Carbondale Municipal Building	75,000	Regional School Fund	100,000		
Moffat–modular rooms	74,000	Rangely Hospital	50,811		
Rifle lift station	66,825	Mesa County transportation	25,000		
Colorado West Area Council of Gov'ts (Planning)	62,500	Rio Blanco County Impact Coordinator	17,500		
Hayden drainage	41,000	Silt planning	15,000		
Meeker Hospital	30,000				
Craig drainage	25,000				
Delta County water	25,000				
Hayden recreation	20,000				
Walden water	15,000				
Rifle planning	10,000				
Silt planning	6,500				

SOURCE Summary and Status of the Mineral Lease and Severance Tax Fund Second Annual Report to the Colorado State Legislature. Colorado Department of Local Affairs 1979

activities have been responsible for rapid population increases in certain rural counties and communities. Until the recent boom, the population in most of these areas had decreased over several decades. As a consequence, the communities have been ill-prepared to respond effectively to current changes.

The oilfields of eastern Utah attracted people to Duchesne and Uintah Counties, although oil drilling there has peaked and the growth is now waning. Area residents hope that the present emphasis on synthetic fuels will lead to a boom from oil shale and tar sands development.²⁹ Increased coal mining has caused growth in Carbon, Sevier, and Emery Counties. In 1960, the population of communities in these counties was under 1,000; several even declined during the 1960's. Because there are no larger towns in the area that can provide housing and other services, they have been forced to absorb all the migration. A resurgence of uranium mining along with oil exploration has stimulated growth in San Juan, Grand, and Garfield Counties. The towns of Blanding, Moab, and Monticello, which have all gained new residents, are expected to continue growing.

Utah created a Community Impact Account in 1977 to assist areas affected by energy development.³⁰ It is a "revolving account for loans and grants to state agencies, political subdivisions of the state, and special service districts which are or may be socially or economically impacted by mineral resource development . . ."³¹ Revenues come from a portion of the State's share of Federal mineral lease payments. Projects are chosen by a board comprised of chairpersons of several State boards, councils, committees, and departments. The board establishes the criteria for awarding grants and loans, determines the order in which projects will be funded, and serves as the sponsoring agency. The chief criterion for determining which projects to support is urgency of need. To date, almost all support has been for water and sewer projects. Only those communities already impacted have received assistance even though

the legislation creating the account specified that those expecting large population increases are eligible for help. The Uinta basin, where the oil shale deposits are located, has not received any funds from the account even though it is undergoing oil and gas exploration and development. Because the Community Impact Account is the only funding source in the State designed to respond to problems associated with energy development, requests for help have far surpassed the available monies. In mid-1979, with only \$4 million available for distribution, a total of \$11 million had been requested.

Adequate water supplies are one of the paramount needs in the energy-impacted areas of Utah. Several towns have had to place moratoriums on additional building because water systems cannot service increased demands, and during summer months many communities are forced to ration the available water. To help solve these problems, the City Water Loan Fund³² was created by the State legislature in 1975. It provides interest-free loans to cities for the construction of water supply and water treatment facilities. The fund provides up to 80 percent of the amount needed with the only qualification that the community be incorporated. Originally the revenue came from taxes on the sale of alcoholic beverages, but recently the funding source was changed to State mineral lease royalties; the amount varies from around \$2 million to \$2.5 million annually. Surprisingly, the fund has pretty well been able to keep up with the demand for loans. Every application has received a loan offer, even though not always the amount requested. A problem that might arise in the long term could be that a loan taken out during a time of boom would have to be paid by the remaining, smaller population during a subsequent time of bust. Also, since the loans are just for water-related projects, help is limited to only this one problem area.

Wyoming

Some of the largest growth in the Western States has been in Wyoming. Between 1970

and 1978, the population in all but one of Wyoming's 23 counties increased. In contrast, in 15 of the 23 it declined in the decade between 1960 and 1970. Much of the recent growth has been related to energy development, although some reflects the trend of settling in rural areas for simpler living patterns or for retirement. From 1970 to 1978, population expanded 30 percent or more in eight counties. These are distributed in three distinct geographical areas. Lincoln, Uintah, Carbon, Sweetwater, and Teton Counties lie in the west and southwest where there are coal, uranium, and oil deposits and the only large oil shale deposits in the State. Most of the growth in Campbell and Converse Counties, in the Powder River basin in central Wyoming, has been from the opening of coal and uranium strip mines. Platte County, in southeastern Wyoming, is the site of a 1,500-MW coal-fired plant.

Wyoming has several programs for managing growth. The major tool, designed for large development activities, is the Wyoming Industrial Development Information and Siting Act.³³ This Act, passed in 1975, requires that any project with construction costs in excess of \$63,588,000 obtain a siting and construction permit from the Industrial Siting Council, a board appointed by the Governor. Before a permit is granted, the developer must submit a plan for the alleviation of social, economic, and environmental impacts, and can be required by the council to undertake their mitigation. For example, applicants can be asked to provide direct loans and grants to a political subdivision. Another management device, created by the Joint Powers Act,³⁴ allows two or more agencies, such as cities, counties, and school districts, to form a Joint Powers Board that can create, expand, finance, or operate facilities. This not only makes possible combined financing by the participating political entities but also makes them eligible for Joint Powers Loans. There is no ceiling on a loan, and the terms must be no longer than 40 years at an interest rate of not less than 5 nor more than 10 percent.

Wyoming also has an array of mitigation programs. (See table 94.) They are funded by Federal mineral lease revenues and State severance and excise taxes. Most are administered by the Farm Loan Board, composed of the Governor, secretary of state, auditor, treasurer, and state superintendent of public instruction. Allocation of funds is specified in most cases by the taxing legislation, and there are few discretionary programs. One alternative available to local communities to generate discretionary revenue is an optional 1-cent sales tax.³⁵ It has been used successfully in several communities although approval by the local voters must be sought every 2 years. Case studies of boomtowns in Wyoming indicate that there are major differences in the effects of rapid growth, and to accommodate these differences, flexible policies are needed. This is especially true for providing such human services as day care centers, youth assistance and senior citizen programs, and alcohol counseling. Too few funds are available to alleviate the social impacts accompanying rapid growth.³⁶

Evaluation of State and Local Mechanisms

State policies regarding social and economic effects vary. In Colorado, local initiative is central in the mitigation process. The State and its oil shale counties and municipalities have been preparing for increased shale development for nearly 10 years. However, in the past, this development has been interrupted or delayed by market changes, regulatory modifications, and technological complications, which has made planning difficult. In addition, oil and gas, coal, electric generation, and uranium industries are all expanding at the same time as oil shale. This complicates the identification of impacts specifically attributable to shale development and adds to the potential for disruption.

An elaborate planning infrastructure is in place in the Colorado counties and municipalities. Over \$40 million has been appropriated for oil shale impact mitigation, with

Table 94.-Wyoming Programs to Mitigate Social and Economic Impacts

Name of mitigation program	Objectives	Funding	Implementing agencies	Comments
Wyoming Industrial Development Information and Siting Act (1975)	Provide information about new Industrial facilities costing over \$63,588,000 Siting and construction permits required before building starts	Not applicable	Wyoming Siting council	Council can require applicants to take actions to mitigate adverse socioeconomic impacts
Joint Powers Act (1975)	Allows different political entities to join together to finance and operate public facilities through a Joint Powers Board	Joint Powers Loans from FLB. ^a FLB is restricted to \$60 million in outstanding loans	Farm Loan Board (FLB) ^a	Some towns and counties have difficulty cooperating. Smaller towns lack manpower to prepare detailed applications.
Wyoming Government Royalty Impact Assistance Account (1976)	Grant program for communities in areas of mineral development	Mineral Leasing Act of 1920, as amended ^b	FLB	Grant funds extremely limited. competition keen
Wyoming Water Development Program (1975)	Encourage optimal development of human, Industrial, mineral, agricultural, water, and recreational resources through projects and facilities for water storage, distribution, and use	1 1/2-percent excise tax on coal Revolving loan account, up to \$100 million can be outstanding	Water Development Commission, Dept of Economic Planning and Development, FLB, local agencies	Requires feasibility study, authorizing legislation, and vote to approve any public debt (such as bonds) before construction can begin.
Coal Tax Revenue Account (1975)	Grants to political subdivisions in areas Impacted by coal development for Public facilities. 50 percent must go for streets and highways	2-percent severance tax on coal Maximum cumulative tax revenues limited to \$160 million	FLB	\$160 million will probably be expended before synthetic fuel development occurs
Capital Facilities Revenue Account (1977)	Permanent capital facilities by legislative appropriation, 30 percent for school district capital construction entitlements, formula allocation to community colleges, remainder for highways	1 1/2-percent excise tax on coal, iron, and uranium Maximum tax revenues limited to \$250 million	Capital Facilities Commission	Used mostly for major State facilities (university, prison), approval of bonds needed for school construction
Wyoming Community Development Authority (1975)	To provide funds for private mortgages at low interest through mortgage lending institutions	Mortgage monies generated through issuance of bonds Authority granted for up to \$250 million in bonds ^c	Wyoming Community Development Authority	Program delayed by litigation. only recently implemented

^aThe Farm Loan Board consists of the Governor, secretary of state, auditor, treasurer, and state superintendent of public instruction
^bSee text for a discussion of Federal financial assistance programs

^cThe 1980 Wyoming legislature has under consideration raising this amount 105750 million

SOURCE: Office of Technology Assessment

over 90 percent allocated to the four counties of Mesa, Garfield, Rio Blanco, and Moffat. (See table 95.) Most of the remainder has gone for the State's support services. As a result, the region is prepared for reasonable growth and is awaiting expanded oil shale development. However, the ability of existing strategies to deal with a large or sudden population influx, such as might occur with a rapid expansion of the industry, is as yet untested. Although the State has ambitious programs, the General Assembly has adopted a cautious approach to the expenditure of the Oil Shale Trust Fund monies. While not required to do so, JBC has elected to retain a principal of \$60 million in the trust fund. This

has caused some discontent in the oil shale region where expenditure of the full amount would accelerate preparations for growth. Because the trust fund is disbursed by legislative appropriation, intrastate political differences also come into play. The General Assembly has greater representation from the eastern, more densely populated, urban parts of the State; thus western slope Senators and Representatives can be outvoted. Impact mitigation, in this case, is subject to the political compromises of the Colorado appropriation process.

Utah and Wyoming have not been preparing extensively for oil shale development im-

**Table 95.—Allocation of Oil Shale Trust Funds,
Fiscal Years 1975-80**

County or agency	Percentage of total appropriation	
	FY 1975-79	FY 1980
Garfield County	285	619
Mesa County	130	124
Moffat County	112	06
Rio Blanco County	400	243
Subtotal-oil shale region	927	992
Delta County	01	0*
Jackson County	005	0
Routt County	37	0
Subtotal-all counties.....	966	992
Division of Energy and Mineral Impact	21	0.6
C W A C O G	12	01
Total	100	100

*The 1979 General Assembly adopted the policy to allocate trust funds only to the counties in the immediate oil shale vicinity.

SOURCE: OTA based on data for FY 1975-79 from Summary and Status Report of the Mineral Lease and Severance Tax Fund Second Annual Report to the Colorado State Legislature, Department of Local Affairs 1979 and FY 1980 from State Appropriation Act for FY 1979-1980 (S. B. 525).

pacts. Both States, however, have had to come to grips with other energy industry expansion, and presumably could use programs similar to the ones now established for coal and uranium mitigation to adjust to oil shale growth. They emphasize a more centralized process with State government playing a larger part in the determination of needs and the allocation of assistance. Utah may be limited by a lack of funding, although the bonus payments from the U-a and U-b lease sales—now being held in escrow pending the outcome of the ownership question—should be available in the future. The State may experience difficulty from a lack of adequate local infrastructures capable of handling rapid growth. Evaluation is complicated for Utah as it is for Colorado by similar uncertainties about the future timing, pace, and size of the industry. Wyoming has many programs that could be adapted for oil shale impact mitigation. At present, its funding levels appear to be adequate.

No State facing social and economic problems from energy development is able to anticipate which communities will be able to adjust to growth and which may be disrupted. Whether towns will suffer from rapid growth or take it in stride depends on a unique set of complicated factors within each community.

For example, Douglas and Wheatland in Wyoming have experienced few of the negative effects identified in the literature as boomtown impacts. Rock Springs and Gillette, on the other hand, appear to be at the opposite end of the spectrum, with the former being the classical example of a town disrupted by energy development. Yet these four communities are undergoing the same types of industrial growth (primarily coal, oil, and gas prospecting and production) and have the same kinds of impact assistance available to them.¹⁷ A conclusion from these cases is that the capability of adapting to rapid growth appears to be highly site specific.

Federal Programs

Only a few of the over 1,000 existing Federal programs are designed to deal with socioeconomic impacts. A 1978 Report to the President³⁸ lists 160 that were judged “potentially applicable to energy impact issues.” They are administered by 20 departments or other Federal agencies. About two dozen programs that are of importance to the Western States have been identified by Murdock and Leistritz.³⁹ (See table 96.) Only those that contribute to the alleviation of negative impacts from oil shale development are examined in detail here, Federal programs can be placed in two broad categories: financial and technical assistance.

Financial Assistance

Section 35 of the Mineral Leasing Act of 1920⁴⁰ is a major source of Federal financial assistance. This legislation originally provided for the Federal Government to return 37^{1/2} percent of the revenues it receives from mineral leases on public lands to the States in which those lands are located; these monies were to be used by the legislatures of the States for support of public schools and roads. In 1976, this section was amended by the passage of the Federal Coal Leasing Amendments Act⁴¹ and the Federal Land Policy and Management Act⁴² (also known as the Bureau of Land Management Organic Act or

Table 96.—Selected Federal Programs Used by Western States for Assistance With Social and Economic Effects of Energy Development^a

Name of program	Implementing agency	Objectives	Comments
<i>Assistance in planning and growth management</i>			
Comprehensive planning assistance HUD 701 program National Housing Act of 1954, as amended (40 U S C 461)	Community Planning and Development, HUD	Strengthen planning and decision-making capabilities of States, local governments, and areawide planning organizations	Urban orientation overall, smaller cities and counties receive funding through States Funds allocated on basis of past population which is a disadvantage to rapidly growing communities Some State and local concern over recent decline in funding levels
Community development block grants—small cities Housing and Community Development Act of 1974 Title I (42 U S C 5301-5317)	Community Planning and Development, HUD	Assist communities in providing decent housing and a suitable living environment, expand economic opportunities	Primarily for urban areas, most funds allocated by formula Some discretionary funds for special-purpose grants to small communities Provides 100-percent funding that can be used as local matching contribution for other programs Can also be used for facility construction as well as for planning
Economic development—planning and technical assistance Public Works and Economic Development Act of 1965, as amended (42 U S C 3151, 3152) Title III	Economic Development Administration (EDA), Commerce	Foster multicounty planning and implementation capability, solve problems of economic growth through project grants, feasibility and other studies, and management and operational assistance	Criteria for project selection makes it difficult for energy-impacted communities to obtain funding Competition for funds is keen.
Technical assistance—personnel sharing Intergovernmental Personnel Act of 1970 (5 U S C 3371-3376)	Office of Personnel Management	Aid in problem-solving and delivering improved services by sharing professional administrative, and technical expertise.	Few communities appear to have taken advantage of program. Time involved in locating and negotiating for an individual may be a constraint for small counties and communities
Water quality planning sec 208 grants Clean Water Act, as amended (33 U S C 1251 et seq.)	Office of Water and Waste Management, Environmental Protection Agency (EPA)	Develop water quality management plans	Funds limited to planning only
<i>Assistance in expanding public facilities and services^b</i>			
Water and waste disposal systems for rural communities Consolidated Farm and Rural Development Act, sec 306 (7 U S C 1926)	Farmers Home Administration (FMHA), Agriculture	Provide amenities, alleviate health hazards promote orderly growth of rural areas by providing new and improved water waste disposal facilities	Sewer and water systems cannot serve areas with a population in excess of 10,000 population, priority is given to communities of less than 5,500 inhabitants
Community facilities loans Consolidated Farm and Rural Development Act, sec 306 (7 U S C 1926)	FmHA Agriculture	Construct, enlarge, or improve community facilities	Targeted for areas with low-income rural residents Priority to projects enhancing public safety (fire, police, rescue services), health care facilities needed to meet life/safety codes, public buildings and courthouses, recreation facilities, new hospitals
Construction grants for wastewater treatment works Clean Water Act as amended (33 U S C 1251 et seq.)	Office of Water and Waste Management, EPA	Assist in construction of municipal sewage treatment works	Funds allocated to States on a population-based formula No funding of collector systems in "communities not in existence" in October 1972 Some difficulty allocating funds on a timely basis
Economic development and adjustment assistance Title IX—EDA Public Works and Economic Development Act of 1965, as amended (42 U S C 3121 et seq.)	EDA, Commerce	Assist State and local governments to arrest and reverse long-term economic deterioration, address dislocations from Federal actions, from compliance with environmental requirements, and from severe changes in economic conditions	Targeted to communities experiencing economic decline but funds are available to energy-impacted areas Flexibility an advantage

Table 96.—Selected Federal Programs Used by Western States for Assistance With Social and Economic Effects of Energy Development^a—continued

Name of program	Implementing agency	Objectives	Comments
Outdoor recreation " BOR program' Land and Water Conserva- tion Fund Act of 1965, et al. (16 U.S.C. 1-4 et seq.)	Heritage Conservation and Recreation Service, Interior	Financial assistance for planning, acquisition, and development of outdoor recreation areas and facilities	Limited funding restricts the number of projects that can be supported A popular program
Planning and site acquisition Sec. 601 program Power Plant and Industrial Fuel Use Act of 1978 (Public Law 95-620)	FmHA, Agriculture	Assist in developing plans for growth management and housing and in acquiring sites for housing and public facilities	Newly Implemented, Currently limited to coal and uranium Impacts,
Assistance for housing Rural housing loans Housing Act of 1949, as amended. Title V, sec. 502 (42 U.S. C. 1471 et seq., 42 U.S. C. 1480; 42 U.S.C. 1472)	FmHA, Agriculture	To assist rural families through guar- anteed/insured home loans	Loans are regarded as a ' source of last resort to be used only if commercial lending Institutions cannot finance housing.
Rural housing site loans Housing Act of 1949, as amended. Sees. 523 and 524. (42 U.S. C. 1490c and 1490d)	FmHA, Agriculture	Assist public or private nonprofit organizations to acquire and develop land to be subdivided on a nonprofit basis for homes.	Priority given to housing for low- and moderate-income families
Rural rental housing loans Housing Act of 1949, as amended. Sees. 515 and 521. (42 U.S.C. 1485, 1490a)	FmHA, Agriculture	Provide economically designed and con- structed rental and cooperative rental housing for rural residents,	

^aThe programs listed are illustrative of the types of aid available in Western States; no attempt has been made to include all possible Federal programs used by impacted communities.
^bGeneral categories are based on the format used by Murdock & Leistritz *Energy Development in the Western United States—Impact on Rural Areas* (New Praeger Publishers 1979).
^cSome sharing acts such as the Local Government Funds Act (Public Law 94-565) are not included; see text for a discussion of the Mineral Leasing Act of 1920 as amended.

SOURCE: Office of Technology Assessment

FLPMA). The Federal Coal Leasing Amendments Act increased the States' share of royalty and lease proceeds to 50 percent, and specifically directs the legislatures, when distributing these proceeds, to give priority to those subdivisions of the State where leasing occurs under the Act. At the same time, the purposes for which the funds could be used were broadened to include "planning, . . . construction and maintenance of public facilities, and . . . provision of public services."⁴³ FLPMA further amends the 1920 Act to authorize the Secretary of the Interior to make loans to States and their political subdivisions. The amounts of the loans are not to exceed the revenues anticipated by the States or their jurisdictions for any prospective 10-year period. Loans are to be repaid, at 3-per-

cent interest, from these proceeds. The language of the Coal Leasing Amendments Act that allows broader use of the funds and specifies their application to affected areas is also extended to the loans.⁴⁴

Section 601 of the Power Plant and Industrial Fuel Use Act of 1978⁴⁵ established the Energy Impacted Area Development Assistance Program (popularly, the sec. 601 program). Its objective is to "help areas impacted by coal or uranium development activities by providing assistance for the development of growth management and housing plans and in developing and acquiring sites for housing and public facilities and services."⁴⁶ The lead agency designated to administer the section is the Farmers Home Admin-

istration (FmHA). The Governor of a State wishing to participate must designate energy-impacted areas and prepare a State investment strategy for allocating the funds. Grant applications for impact aid must be consistent with the State investment plan. Local governments, councils of local governments, and State agencies are among the eligible applicants. Grant funds will pay 100 percent of the costs of developing plans for managing growth and/or plans for new housing, and up to 75 percent of the cost of acquiring or developing sites for housing, public facilities, or services.

Three criteria are specified for designation as an impacted area. First, employment in coal or uranium development activities must have increased, or be expected to increase over 3 years, by 8 percent or more from the preceding year. Second, the increased employment must result in a housing shortage or inadequate public facilities and services. Third, the available State and local financial resources must be inadequate to meet the current needs or those projected for the following 3 years. Within the oil shale region, the purchase of land by the city of Meeker for the construction of low- and moderate-income housing was included as a priority project in the 1979 Colorado investment strategy.

Technical Assistance

THE FEDERAL REGIONAL COUNCIL

The Energy Impact Office of the Federal Regional Council (FRC), Region VIII, oversees Federal technical assistance programs. The Office was created early in 1978 to coordinate the response of Federal agencies to local needs. In addition to the development of an improved system of service delivery, the FRC efforts are designed to evaluate Federal legislation for impact assistance and to collect impact data and related information. The agencies comprising the Federal Regional Council are the Departments of Agriculture; Commerce; Energy (DOE); Health, Education, and Welfare; Housing and Urban Development (HUD); the Interior; Labor; Transportation; the Community Services Administration, and

the Environmental Protection Agency (EPA). Senior staff members of these agencies make up an Intergovernmental Committee that assists the Energy Impact Office.

Dissemination of information and inter-agency coordination are the main functions of the Federal programs. Several examples can be cited. FRC has a representative in the Oil Shale Environmental Advisory Panel (OSEAP) who serves as contact with this group. The Federal Assistance Program Retrieval System (FAPRS) is a computerized information bank, keyed to programs described in the Catalog of Federal Domestic Assistance. The Energy Impact Office uses it to help communities identify various Federal assistance programs and determine their eligibility for aid. DOE's Office of the Regional Representative, Region VIII, in cooperation with FRC, publishes an annual Regional Profile—Energy Impacted Communities⁴⁷ that collates data on the energy impacted areas.

OFFICE OF THE AREA OIL SHALE SUPERVISOR

The Office of the Area Oil Shale Supervisor of the U.S. Geological Survey (USGS) also provides technical assistance to communities by serving as a clearinghouse for information about social and economic impacts and programs for their alleviation.

Summary of Federal Support Initiatives

At the present time, there is no single Federal policy with respect to the social and economic effects of energy development. At the regional level, the Federal point of view is best expressed in the Region VIII DOE Regional Profile. The edition of March 1979 reiterates a position taken in earlier volumes:

The Region VIII office maintains the position that local communities and counties must take the initiative to become involved in assessing, planning for, and mitigating adverse energy related impacts. To effect a team effort involving industry, Federal, State, and local government, the initiative and follow-up must first be taken by local leadership."

Several programs are operating that address limited aspects of socioeconomic effects but, at present, none directly addresses the impacts that may come with synthetic fuel development or the specific consequences of accelerated shale oil production. A wide variety of assistance is available through avenues not specifically designed to deal with energy development impacts. These various Federal programs have different emphases and modes of providing help, and impacted communities must compete with everyone else for the limited funds available.

These regular Federal programs usually require elaborate proposal development but small towns with limited manpower often do not have the expertise to prepare grant applications. Furthermore, many programs have lengthy review processes before decisions are made, which can be a disadvantage for boomtowns. For example, EPA grants for sewer facility upgrading take about 3 years from the time of application to the time of decision; if a community does not get a grant, this time is lost entirely and the town can only fall further behind in its effort to keep up with its growth. In addition, although the specific programs may be adequately meeting the needs for which they were designed, their limited nature means that the cumulative impacts of all types of industrial development are not being addressed.

At present, the major role of the Federal Government is providing revenues for mitigation; these monies come primarily from the Mineral Leasing Act of 1920, as amended. A somewhat expanded Federal impact mitigation role is found in section 601 of the Powerplant and Industrial Fuel Use Act of 1978. The extent and nature of any additional Federal involvement in impact mitigation are controversial. On the one side, it can be argued that social and economic impacts are State and local problems. They should be viewed as the inevitable consequences of industrial development, and the Federal Gov-

ernment need not be involved with their amelioration. This viewpoint, opposing Federal involvement, also contends that specific Federal mitigation programs would increase bureaucracy, and cites the public's growing displeasure with the perceived intervention of Federal agencies in the daily life of the citizenry as a reason for not expanding Federal activities. On the other side is the position that national requirements are the root causes of the local impacts, therefore an expanded Federal role is appropriate. Several Western States contend that because expanded domestic energy production is a national goal, for reasons of equity the Federal Government should assume a more direct role in the alleviation of negative impacts from this development.

Assuming additional Federal involvement is desired, how can the Government most appropriately assist impacted communities? One position is that providing financial assistance is sufficient programmatically and only the amounts need to be increased; new programs and regulations are not desirable. Another position is that Federal regulation could be used to mitigate impacts by, for example, pacing industry's growth rate through leasing policies. A third position is that the Government should be substantially involved in mitigation programs that use Federal funds. Part of this issue includes the question of when and where the Federal Government might to be involved. The provisions of the Powerplant and Industrial Fuel Use Act suggest that it should step in only when State and local governments cannot handle impact problems. A similar position is that Federal participation should be confined to areas requiring long-term commitments, such as housing, sewer, and water systems. Another possible Federal approach could be to help specific groups (such as retired persons on fixed incomes or young adults seeking to enter the job market) who may be particularly hard hit in boomtowns.⁴⁹

Possible Consequences of Oil Shale Development

General Effects of Rapid Population Growth

The recent development of energy resources has caused large numbers of people to move into established rural communities within short periods of time. All parts of a community are affected by this kind of growth. Local government agencies are pressed to provide additional services. A major difficulty is that the expanded facilities and services are needed before new tax revenues can be realized. A 3- to 5-year lag appears to be the average between the time the increased services and facilities are required and the time additional revenues can be generated. (See figure 71.) In the long run, how-

ever, local governments should benefit from the increased tax base resulting from energy development.

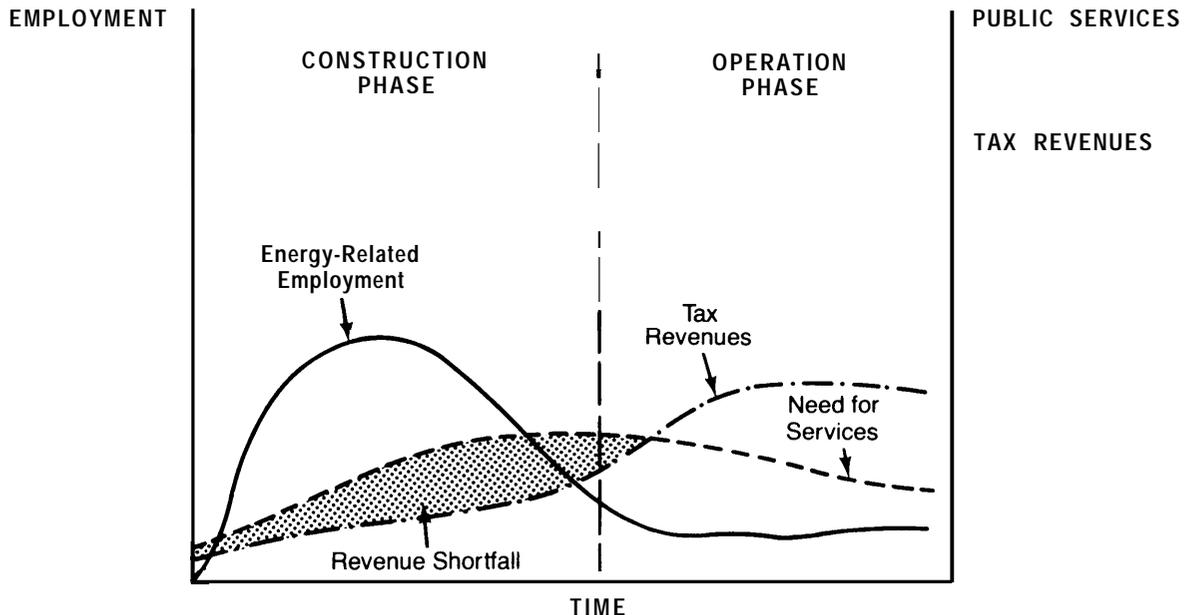
Local governments need help in the early stages of rapid growth. One traditional means of raising the needed funds is by issuing bonds. While this remains important, experience indicates that it is far from adequate. First of all, State law usually places limits on the amounts of indebtedness that counties and communities can incur through bond issues. Second, the assessed valuation upon which bonding limits are based increases over the life of a project but funds are needed during the early stages when the population is growing rapidly. Third, local



Photo credit: OTA staff

Municipal facilities will need to be upgraded to handle the population growth

Figure 71.—Energy-Related Employment, Tax Revenues, and Need for Public Services in an Area Affected by a Large-Scale Energy Development



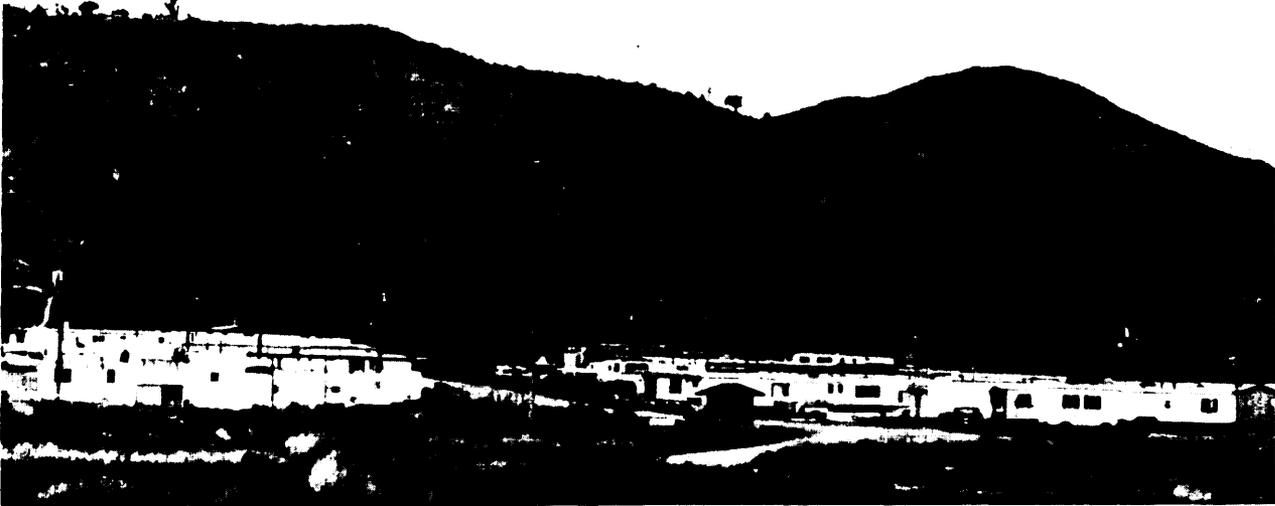
SOURCE S H Murdock and F L Leistritz. *Energy Development in the Western United States*, 1979, Praeger Publishers

residents are often afraid to approve bond issues because of the instability of the boom cycle. People who have moved in during construction, and who are among those needing new services and infrastructure, usually leave at the end of the construction period. Longtime residents are fearful that they will be left to discharge debts incurred during this period. Consequently, voters in many of the most severely impacted communities have rejected bond issues. Similar difficulties are found with loan and loan-guarantee programs. In this instance, the statutory or constitutional limits on the debt that rural communities can incur is an obstacle to the use of the loans to meet front-end funding needs.

Yet another statutory limitation can be a ceiling on the expansion of local government budgets. For example, in Colorado most small towns are prohibited from "the levying of a greater amount of revenue than was levied in the previous year plus seven percent . . ."⁵⁰ The practical effect of this restriction on mill levy increases is to limit municipal and county budgets to a 7-percent-per-annum growth.

Finally, the ability of local governments to respond may be complicated because the development and the population growth may be in different places. When the project is in one taxing jurisdiction and the community in a different one, there is a jurisdictional mismatch. In this case, the town that must provide increased facilities and services cannot look forward to larger revenues from taxes on the new industry.

In the private sector, housing can be a major problem. It usually is in short supply; its prices are often greatly inflated; and land may not be available for new construction because of terrain, price, or public ownership. Shortages of construction financing and mortgage money are common and, in some cases, new employees may not qualify for mortgages. The need for temporary housing for construction workers can exacerbate these problems. Mobile homes often fill this need but their siting and providing services to the sites add to the difficulties faced by local government. Industry has, in several instances, sought to assist by supplying capital



S g m b m m p p b m

for housing construction. Because public housing is statutorily limited to low- and moderate-income groups, Federal Government agencies cannot provide much help.

Other affected parts of the private sector are the local retail trade and service industries. These businesses often anticipate increased income from energy development. What may not be expected are increases in labor costs, taxes, and competition. In some cases, this sector has not been able to meet the new demands; business failures have been the most extreme consequences. More common have been difficulties in getting and keeping help, providing the goods that customers want, and expanding stores and shops to keep up with the increased business. Like local governments, retail businesses should profit in the long run from energy development; their dislocations occur during the early periods of rapid growth when services cannot keep up with the new demands.

Those parts of the community that provide services to the residents also are affected. In many areas, this support sector is inadequate prior to any sudden growth. For example, doctors and dentists are not readily available in many rural regions. School systems, while established, cannot offer broad curricula,

and may have difficulty attracting and keeping personnel. The number of public safety professionals often is limited. Sheriff's offices and town police departments seldom have large forces; fire protection is usually provided by volunteer departments. Recreation facilities may be lacking. Social welfare services may depend on itinerant professionals, such as a public health nurse or social worker who visits the communities periodically.

The functions of a community's social infrastructure often are carried out through informal social networks. In rapid growth situations, these networks can break down simply because of the increased number of newcomers. If there are no established formal structures, then the services cannot be provided. For example, in many rural communities the school is the center of recreational activities, and there are few structured programs. Increased demands to use the school gym cannot be met because there aren't enough hours in the day or enough basketball courts to accommodate the large number of new players. Established informal recreation patterns can thus be disrupted and nothing takes their place until a formal community program can be set up. The effects of rapid population growth on the various aspects of

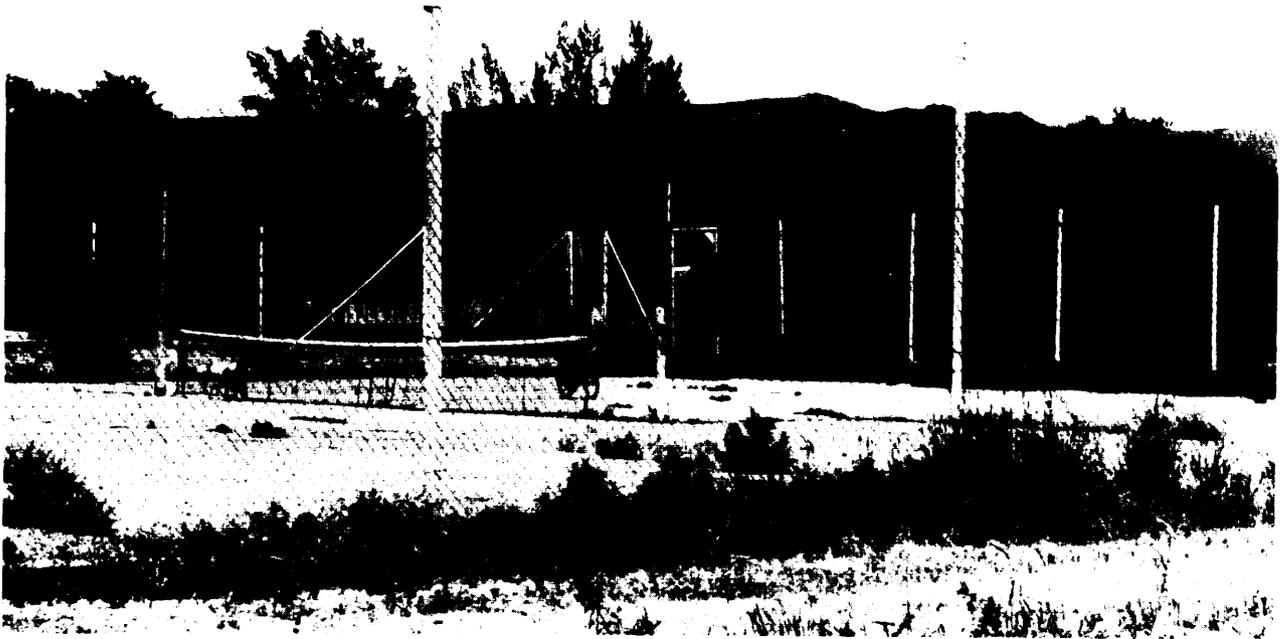


Photo credit OTA staff

Adequate recreational areas are often lacking in boomtowns

the existing community support systems are among the more ubiquitous social impacts of energy development activities.

Rapid growth inevitably causes social changes; those communities experiencing excessive strains on their social structure from sudden growth have been called modern boomtowns.⁵¹ A well-documented example is the Rock Springs—Green River (Sweetwater County) area of Wyoming.⁵² Here the population grew from 18,391 in 1970 to 36,860 in 1974. Among the consequences were:

- Housing availability fell far short of demand. In 1974, between 4,500 and 5,000 families were living in mobile homes, many on scattered, isolated tracts in unincorporated parts of the county.
- These housing areas often lacked adequate water, sewer, and other facilities.
- Health care became a major problem. An estimated 40 percent of the residents had to seek medical care outside the county; the mental health clinic caseload

expanded ninefold as alcoholism, suicide attempts, and divorce rates soared.

- Local government was overwhelmed with difficulties. Costs for capital construction of public facilities, such as water and sewer treatment plants, were greater than the communities' borrowing capacity, and demands for public services, such as fire and police protection, were beyond the available resources.
- Schools could not keep up with the pupil increases. The school districts were already bonded up to the legal limit and were not able to provide the needed additional services.
- As a result of the boomtown conditions, industry was unable to recruit and retain employees. Employee turnover in 1973 ranged from 35 to 100 percent, and productivity declined. Cost overruns resulted from construction delays.⁵³

It is difficult to determine whether a community will be able to respond adequately to

the pressures of growth; however, some generalizations have been drawn from case studies of towns like Rock Springs and Green River. Boomtowns have been described as having the following characteristics:⁵⁴

- a small population base, usually under 10,000 residents;
- geographic isolation from urban areas;
- rapid population growth;
- a shift in economic activities away from agriculture, trade, and services to constructing and operating energy-related industries;
- demand for temporary and permanent housing that exceeds supply, with accompanying price escalation;
- increased symptoms of social stress such as crime, truancy, child abuse, alcoholism, and suicide;
- inability of the public sector to provide, in a timely fashion, services and facilities such as streets, water, and sewers;
- dislocations in the private sector such as business failure, labor shortages, and cost increases;
- strain on health services from increased need for access to professionals and facilities;
- high employee turnover with accompanying decline in productivity; and
- in the early stages, a lack of community concern for planning and growth management.

Alterations in human relationships underlie the changes accompanying rapid growth.⁵⁵ Some social and behavioral scientists contend that these are among the most pervasive and significant consequences of growth and are the basic causes of boomtown symptoms.⁵⁶ Among the alterations that have been identified in the social roles individuals must fill are increased anonymity, impersonalization, and specialization. At the institutional level, greater bureaucratization, centralization, and orientation of community units toward systems outside the local social structure have been found.⁵⁷ Among the psychological factors identified in boomtowns are value conflicts between established residents

and in-migrants, and shifts in personal interaction patterns such as the deterioration of longtime friendship patterns. At the social institution level, dramatic realignments of political party membership, and an atmosphere of uncertainty about the future that undermines established systems of social control have been documented.⁵⁸ On the other hand, a comparison of the experiences of four Colorado boomtowns found a picture of resilience and adaptability suggesting the “hope that people can adjust to changes instead of being overwhelmed by them”⁵⁹

Anticipated Growth in the Colorado Oil Shale Region

As a sparsely populated, rural region, western Colorado is vulnerable to boomtown conditions. The three oil shale counties had a population of 90,748 at the time of a special census in 1977. Growth between 1970 and 1977 ranged from 5 percent for Rio Blanco County to 27 percent for Garfield County; the largest growth (58 percent) was in Moffat County, to the north of the oil shale region. (See table 97.) None of the communities in the immediate area had a population over 3,000. (See table 98.) There are 2 to 19 persons per square mile and a high proportion of older residents. (See table 99.) Sixteen percent of the residents of the oil shale communities in Rio Blanco and Garfield Counties are over 65 years old, which is over sixty percent higher than the national average.⁶⁰

The first step in attempting to forecast whether there might be disruption is to gauge the magnitude of possible migration to the area. As indicated earlier in the chapter,

Table 97.—Population Growth of Colorado Oil Shale Counties 1970-77

County	Population 1970	Population 1977	Percent change
Rio Blanco	4,842	5,100	5.3
Garfield	14,821	18,800	26.8
Mesa	54,374	66,848	22.9
Moffat	6,525	10,303	57.9

SOURCE U.S. Bureau of Census data

Table 98.—Population of Colorado Communities Apt To Be Affected by Oil Shale Development, 1977

Location	Population
Rio Blanco County	
Meeker	1,848
R a n g e l y	1,871
Garfield County	
G l e n w o o d S p r i n g s	4,051
Grand Valley	377
N e w C a s t l e	543
Rifle	2,244
slit	859
Mesa County	
De Beque	264
Grand Junction	25,398
Moffat County	
C r a i g	6,677
D i n o s a u r	347

SOURCE 1977 special census

Table 99.—Selected Demographic Indices of Oil Shale Counties of Colorado, July 1975

County	Number of people per square mile	Percent aged 65 and over
R i o B l a n c o	2	8.3
G a r f i e l d	6	105
M e s a	19	119
M o f f a t	2	8.3

SOURCE Bureau of the Census *City and County Data Book 1977*

CWACOG has a growth-monitoring system that provides projections of future growth. Because this organization serves the day-to-day needs of the individual counties and communities, the projections are frequently modified in an attempt to reflect the current situation. To an outsider, there appear to be several sets of data none of which coincide since it is possible for a town to be using one set of projections to plan for additional housing, another to determine water and sewage treatment requirements, and a third to estimate the costs of providing public services. Although this arrangement creates some confusion as to which projections are the most accurate, it is important to modify projections when the assumptions change. As an illustration, Rangely's projections have been overestimated in the past because they have assumed a new road would be built from the town to tract C-a. Since the road was not being constructed when the most recent housing projections were made, the CWACOG

housing data took this into account and Rangely's figures were adjusted downward; but because these revisions are not reflected in all of the projections, discrepancies can be found between different sets of data.

Each year, CWACOG prepares for the region an official set of projections to the year 2000, based on the following information:

- baseline population data from the 1970 regular and a 1977 special U.S. census;
- energy company employment projections with a family multiplier (2.0);
- support industry worker multipliers with accompanying family multipliers (2.5);
- base worker distributions assigned by county and community; and
- cohort survival factors.

Three population projection scenarios are derived using these factors:

- Scenario I— Natural population growth without energy development;
- Scenario II— Growth with energy industry development, as presently planned;
- Scenario III— Growth with energy development including shale oil production of 500,000 bbl/d in 1990 and 750,000 bbl/d in 1995 and 2000.

The first scenario is a conservative estimate of growth with a population induced from non-energy-related employment figures. Its major benefit is to provide a lower limit against which to compare the growth scenarios. The second scenario, growth with energy development, contains base worker projections from 18 companies including 6 that expect to proceed with oil shale development. These are the developers of tracts C-a and C-b, Superior, Union Oil, Paraho, and Colony (Atlantic Richfield and Tosco).⁶¹ This scenario has been selected by the CWACOG Board as the officially endorsed set of projections because it reflects the stated plans of companies active in the region. The third scenario illustrates an upper limit generated by assumptions for a rapidly deployed oil shale industry.

The latest official CWACOG projections for the oil shale counties, published in Novem-

ber 1979, show that Rio Blanco and Garfield Counties are expected to have sharp population increases under the energy development scenario. (See table 100 and figure 72.) The number of people in Rio Blanco County is forecast to be, by 1985, four times the 1977 special census count, while the number in Garfield County is seen as nearly tripling. Moffat County is projected to have a large increase in the early 1980's but this growth is attributed to coal and electric generation development, not to oil shale, Mesa County is expected to grow without extreme fluctuations, but the number of people is projected to nearly double by 1990 over the 1977 figure.

CWACOG prepares projections for individual communities as well as for the counties. (See figure 73.) For the energy development conditions (Scenario II), these figures reveal:

- Rifle's population is projected to grow by 1985 to over six times the 1977 count.
- Meeker's population is projected to grow by 1985 to over seven times the 1977 count.
- Rangely's population is projected to grow by 1985 to over three times the 1977 count.

The projections for Scenario III, assuming an industry producing 500,000 bbl/d of shale oil by 1990 and 750,000 bbl/d by 2000, disclose exceptionally high growth for the region. By 1985, Rio Blanco County is projected to have almost 8 times the number of people counted in 1977; Garfield is forecast to have 3½ times its 1977 count. Mesa and Moffat Counties are not forecast to have such spectacular growth, although Mesa County's population is seen as growing to almost 3 times the 1977 figure by 2000.

The populations of Rifle, Meeker, and Rangely are projected to increase from around 2,000 to over 22,000 by 1985, with a net increase of approximately 18,860 residents for Rifle. Like the counties, the biggest increments for the towns occur in the early years, between 1980 and 1985. Under Scenario III, the projected growth for these three communities exceeds 500 percent in the period between 1980 and 1985. (See table 101.)

Needs Arising From Anticipated Growth

The projections are used by the counties and communities to prepare plans for their

Table 100.— Population Projections by Development Scenario for the Oil Shale Counties of Colorado

	Rio Blanco	Garfield	Mesa	Moffat
1977				
Actuals ^a	5,100	18,800	66,848	10,303
1979				
Estimated ^b	5,580	22,000	75,000	10,925
1985				
Scenario I ^c	5,779	28,181	101,005	11,509
Scenario II	22,809	50,559	107,855	15,306
Scenario III	40,501	66,820	128,460	18,892
1990				
Scenario I	6,177	32,080	121,091	13,311
Scenario II	19,522	56,909	128,308	17,090
Scenario III	35,881	71,621	147,583	24,302
2000				
Scenario I	6,973	45,344	161,266	16,914
Scenario II	20,318	83,012	169,882	20,693
Scenario III	44,303	95,365	190,484	27,905

^aFrom a 1977 special U.S. census

^bEnd of the year estimate prepared in July 1979 by the Colorado West Area Council of Governments

^cBased on the following

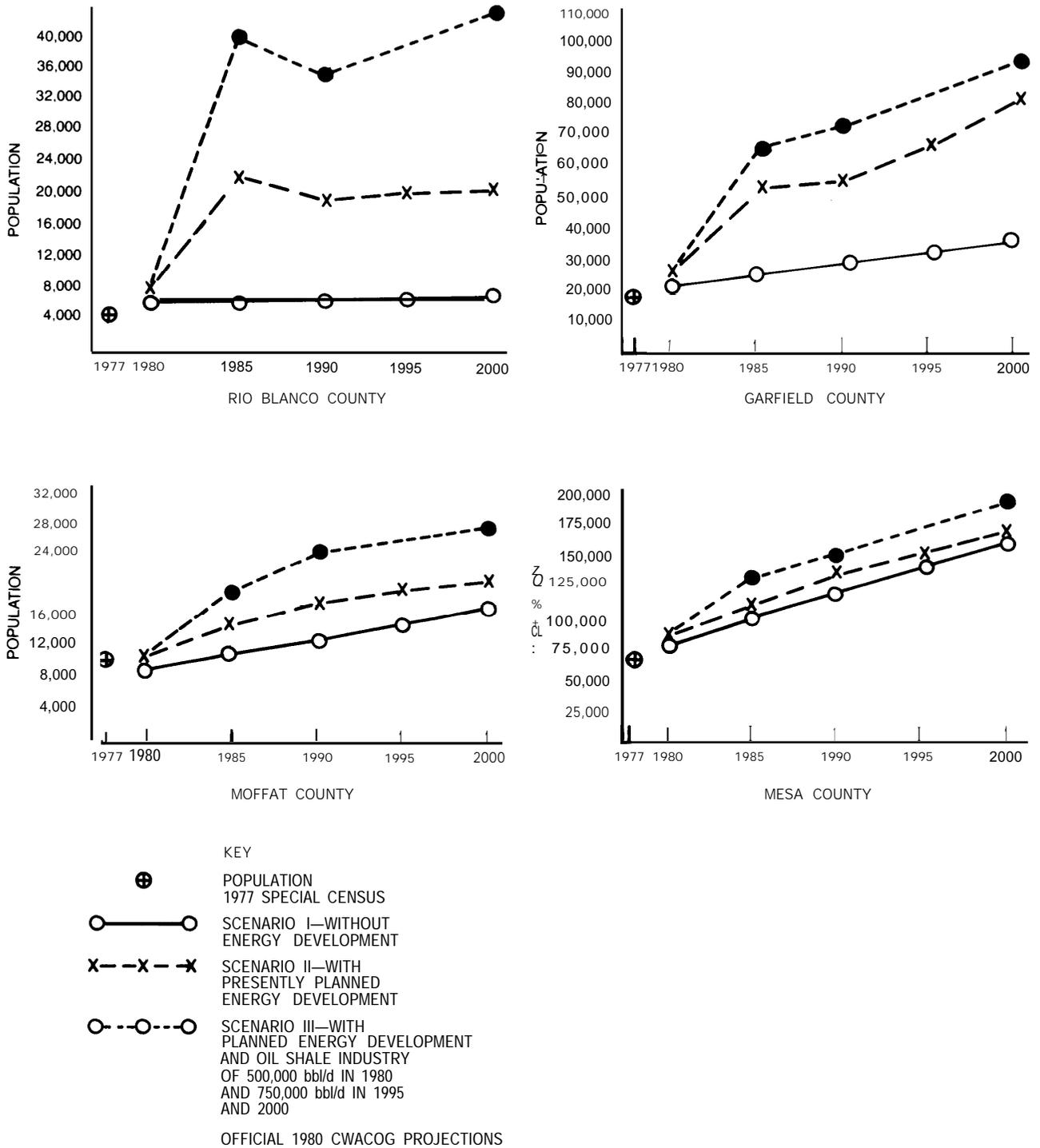
Scenario I - Natural population growth without energy development

Scenario II - Growth with energy development according to employment forecasts from 18 industries active in the region (official 1980 CWACOG projections)

Scenario III - Energy development including shale oil production of 500,000 bbl/d in 1990 and 750,000 bbl/d in 1995 and 2000

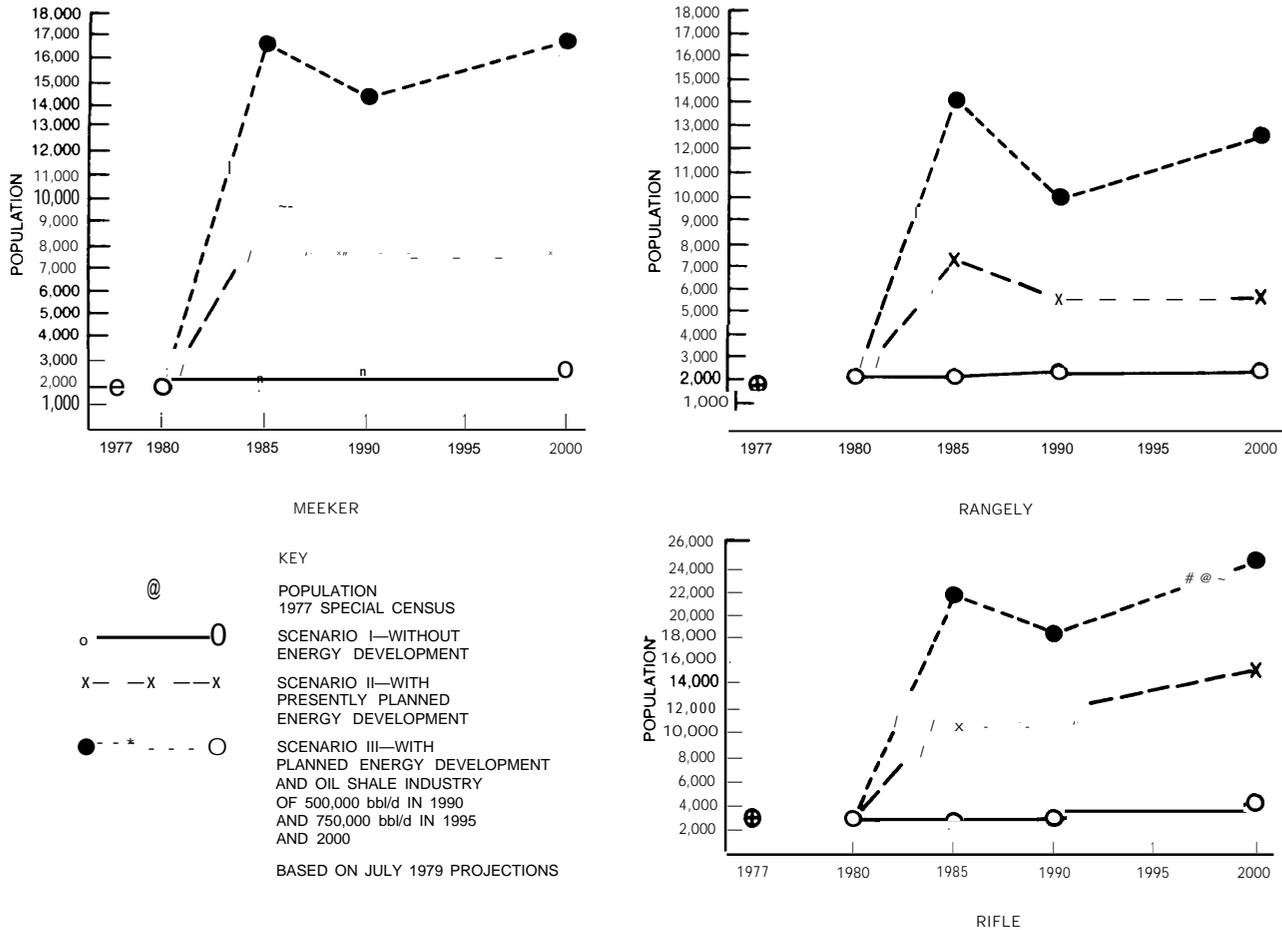
SOURCE Colorado West Area Council of Governments

Figure 72.—Population Projections for Colorado Oil Shale Counties by Development Scenario, 1980-2000



SOURCE Colorado West Area Council of Governments

Figure 73.—Population Projections for Selected Oil Shale Communities in Colorado by Development Scenario, 1980-2000



SOURCE Colorado West Area Council of Governments

growth. There are over 20 documents that identify specific needs expected to arise in the period between 1980 and 1985. * Examples in the following discussion have been taken from these various planning documents.⁶²

Needs for the entire region are mainly in the areas of health and education; over 90 percent of them are for improving schools and upgrading hospital facilities. Technical assistance for CWACOG is also included.

*Because the needs appear in plans prepared by different groups at different times, a variety of CL WACOG projections have been employed (see discussion at the beginning of the preceding section). For this reason, it is difficult to link specific requirements directly to the CWACOG population scenarios.

Table 101.—Projected Population Growth of Selected Oil Shale Communities, 1979-85

Community	Projected population 1979 ^a	Projected population 1985 ^b	Percent Increase
Rifle	3,200	22,060	589
Meeker	2,250	16,745	644
Rangely	1,900	14,088	641

^aEstimate at end of year

^bCWACOG Scenario III (does not include fringe areas around each town)

SOURCE OTA based on projections from the Colorado West Area Council of Governments

Compilation of regional requirements is complicated by overlapping or differing jurisdictions for a number of services. For example, the Valley View Hospital, located in Greenwood Springs, in a recent needs assessment

included as a service area the central part of Garfield County. This portion of the county encompasses Rifle, site of the Clagett Memorial Hospital, and overlaps the Grand River Hospital District in which the Rifle hospital is placed. School districts, although not overlapping, encompass a number of different communities, which makes it difficult to separate their requirements from those of the municipalities. Sanitation and recreation districts with differing boundaries add to the complications.

For Garfield County, planning documents contain over two dozen projects needed between 1979 and 1984: 41 percent of them are in the area of education; 19 percent in the health and medical services; 15 percent in public services, especially water supply projects; 11 percent each in mental health and public facilities, the latter primarily roads; and 3 percent for welfare services.

Rio Blanco County and its communities, Meeker and Rangely, expect large growth from expanded shale development. For the period from 1980 to 1985, planning groups have identified five categories of needs for the county. About half are for public facilities and services: roads, highways, and bridges; airport improvements; trash compactors; a public safety building; and similar projects. Educational necessities, hospital improvements, recreational projects, and support for the planning infrastructure make up the remainder.

Needs From Oil Shale Development

Several different kinds of energy industry activities are taking place in the region. Unless it is rapid, the expansion of the oil shale industry, in and of itself, may not disrupt the communities of western Colorado; combined with accelerated coal development, oil and gas exploration and production, the installation of electric generation plants, and the possibility of other synthetic fuel activities, the effects could be devastating. Separating the potential consequences of shale development from the combined effects is dif-

ficult, and local planners do not try to do so. The following discussion emphasizes oil shale development while recognizing that it will occur in the larger context.

Mesa County

The effects on Mesa County depend on the location of development. At present, between 30 and 40 percent of the employees at Logan Wash facilities operated by Occidental Oil Shale, Inc., live in the Grand Junction area, and further development along the southern rim of the Piceance Basin would add to these direct effects in the county. Otherwise, they are likely to be indirect, taking the form of demands on the transportation and service sectors, both public and private, and on support industries. Benefits, such as increased revenues and cash flow, will occur when shale workers go to Grand Junction to purchase goods and services.

De Beque is the Mesa County community now experiencing direct effects of oil shale development activities. It is the nearest community to Logan Wash and exemplifies several of the problems associated with boomtown growth. It is located in Mesa County, while Logan Wash is in Garfield County; thus tax revenues from the energy development accrue to a jurisdiction different from the one receiving the impacts. De Beque has had difficulty preparing for increased growth, particularly in dealing with the effects of inflation. A 1976 study detailed the improvements needed by the water supply system. It estimated the costs at \$608,000; when bids were opened in 1978, they came to \$787,000; but only \$500,000 was available. The city was unable to assume any additional debt and had to turn to the State for help. When completed, the facilities will be adequate for the present population but would have to be expanded if a large number of new residents were to be accommodated.

Garfield County

In 1975, the Colony Development Operation proposed that a new residential community,

to be called Battlement Mesa, be constructed south of the Colorado River near Grand Valley. The Garfield County commissioners granted zoning approval for the development of 7,000 housing units for up to 21,000 residents, to be constructed over a 10- to 15-year period. Colony invested a little over \$3 million in land acquisition and related activities for Battlement Mesa. The new town was designed to serve the Colony shale activities on Parachute Creek; actual development of the site was suspended when the company chose not to move ahead with its plant. It is probable the new town will be constructed in the 1980's.

RIFLE

Rifle is the community displaying the most visible effects of shale development activities. It is estimated to have grown by about 1,000 residents from the 1977 census figure of 2,244. Using the increase in the value of building permits as an indicator, it has grown about 45 percent in the past 2 years. A population of 10,000 has been used as the target

for planning purposes, and city officials feel this number could be accommodated within the next 3 to 5 years. Over 40 projects have been identified as needed between 1979 and 1984 to ease the effects of this expected growth. About half of these are for public facilities, mostly water supply projects and public buildings. About 10 percent are for roads, and another 10 percent for public services, such as a new fire-rescue vehicle. Educational expansion, including programs and buildings, account for another 10 percent, with housing, health, and recreation projects representing the remainder.

Rifle is beginning to display some symptoms of boomtown stress. The incidence of reported spouse and child abuse is increasing. Statistics maintained by the police department show a rise both in the number of juvenile crimes and in cases of substance abuse; alcohol abuse is the biggest problem. Mental health personnel note an increase in the number of individuals having problems in their relations with other people. Consistent data col-



Photo credit OTA staff

View of Rifle, Colo.

lected over several years are not available in these categories, but what has been obtained points to the emergence of increasing social and psychological stress.⁶⁴

A large number of retired persons live in the area, and more than 20 percent of the population is estimated to be over 60 years old. A number of programs have existed for several years for these residents, and they themselves are active advocates for their interests. Should the current rate of inflation be compounded by increased costs from rapid growth those who live on fixed incomes would suffer even more than they are now.

For some time, Rifle has had severe traffic congestion. The main highway to the north goes through the middle of town, passing the elementary and high schools. Dust and exhaust fumes, particularly from trucks, have polluted the downtown area. It has taken a long time to correct the problem because of the necessity to coordinate plans with the State highway department. City services have been hampered by a lack of adequate office space. Rifle is in the first stage of a planned three-stage water expansion project. The entire project will accommodate 10,000 residents, in increments of 3,000 to 3,500 per stage. The sewer system is also currently being upgraded.

Sufficient land is available for about 1,700 new housing units; construction has been underway in recent years. The junior high school building is being expanded and, on completion of the addition, will become a combined junior-senior high school. A new elementary school is needed and the city has applied to the State for assistance in its construction. The hospital needs to expand its outpatient facilities. The nursing home is operating almost to capacity, and will soon require repairs and renovation.

OTHER GARFIELD COUNTY COMMUNITIES

Grand Valley reflects the types of difficulties faced by communities living with the uncertainties of energy development. Several years ago, in anticipation of growth from increased oil shale development, the school was

expanded. Because the expected growth did not come to pass, the school is presently operating below capacity; and the citizens, while desiring it, view current promises of development with some skepticism.⁶⁵ Like Silt and New Castle, Grand Valley has had to place a moratorium on new building because the water and sewer systems are operating at, or beyond, capacity. The town applied for an EPA construction grant for a new sewage treatment facility in 1976 but did not know if it would receive the funds until 1979. In the interim, it tried to obtain money from the Colorado Department of Health, but was unsuccessful. Although the EPA grant, plus assistance from the Oil Shale Trust Fund, has now been received, the site had not been approved in mid-1979.

Silt is one of the fastest growing communities in the valley. The population doubled between 1970 and 1977—from 434 to 859—and the town planner believes it was close to 1,000 at the end of 1979.⁶⁶ The CWACOG projections estimate 1,211 by the end of 1980 under energy development conditions (Scenario II). Current plans call for public facilities to accommodate 2,800 residents by the mid-1980's. These facilities include an improved water supply and an expanded sewer system. The sewer system improvements are currently in the design phase and the water system is already being upgraded. Like many small communities, the town lacks sufficient skilled manpower. There is only one police officer and no budget for additional personnel. Only two people are in the public works department, and they cannot keep up with the increased workload.

In New Castle, ultimate growth probably will be limited by the availability of land, since the town is located in a fairly narrow part of the Colorado River valley. The official CWACOG energy development projections estimate a population of 1,055 in 1985 and 1,608 by 2000. The city is now improving its water supply and distribution system to permit additional growth; a moratorium on new water taps was necessary after a new elementary-junior high school facility was opened. A revitalization of coal mining in the

area could combine with oil shale development to add to growth pressures in the town.

Because Glenwood Springs, the county seat, is located in the eastern part of Garfield County, the community will experience more secondary than direct effects. The city has been growing mainly from recreational development in the Aspen and Vail areas. If the communities down the Colorado River valley are unable to cope with rapid growth, the consequences will extend to the Glenwood Springs area.

In sum, Garfield County has received most of the growth so far from oil shale development. This growth has been combined with the expansion of other industries and, as a result, the county has been pressed to meet the needs of the new populace. All the communities in the area have increased population, and three have had to place moratoriums on new construction because of inadequate water and sewer systems. Rifle should be able to accommodate a population of 10,000 if current plans can be completed, but is already beginning to experience some of the symptoms of boomtown conditions. If accelerated growth occurs, Rifle will need additional funds in order to make public facilities and services available to the new residents, and will have to increase its efforts to prevent social and individual stress.

Rio Blanco County

In anticipation of future growth, a significant planning effort has been underway for a half-dozen years, zoning and other growth-control laws have been enacted, and support for these measures appears widespread. Roads have been a longstanding need but their cost has proven a barrier to construction. Extension of County Road 24 from the C-a tract site to Rangely was proposed by the developers in their early plans (see figure 74); however, the State legislature has been reluctant to appropriate funds for construction. A feasibility study of 10 alternatives was made and 1 was recommended to the State: planning for it is now underway. Timing is criti-

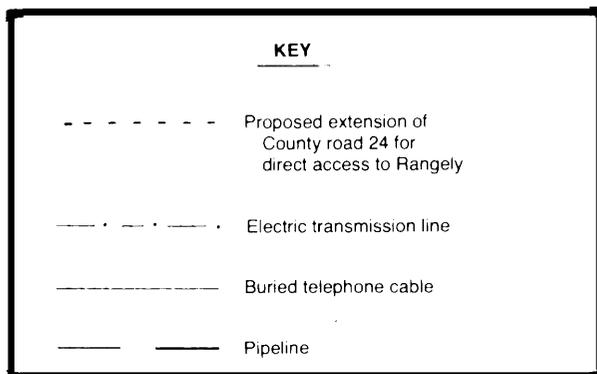
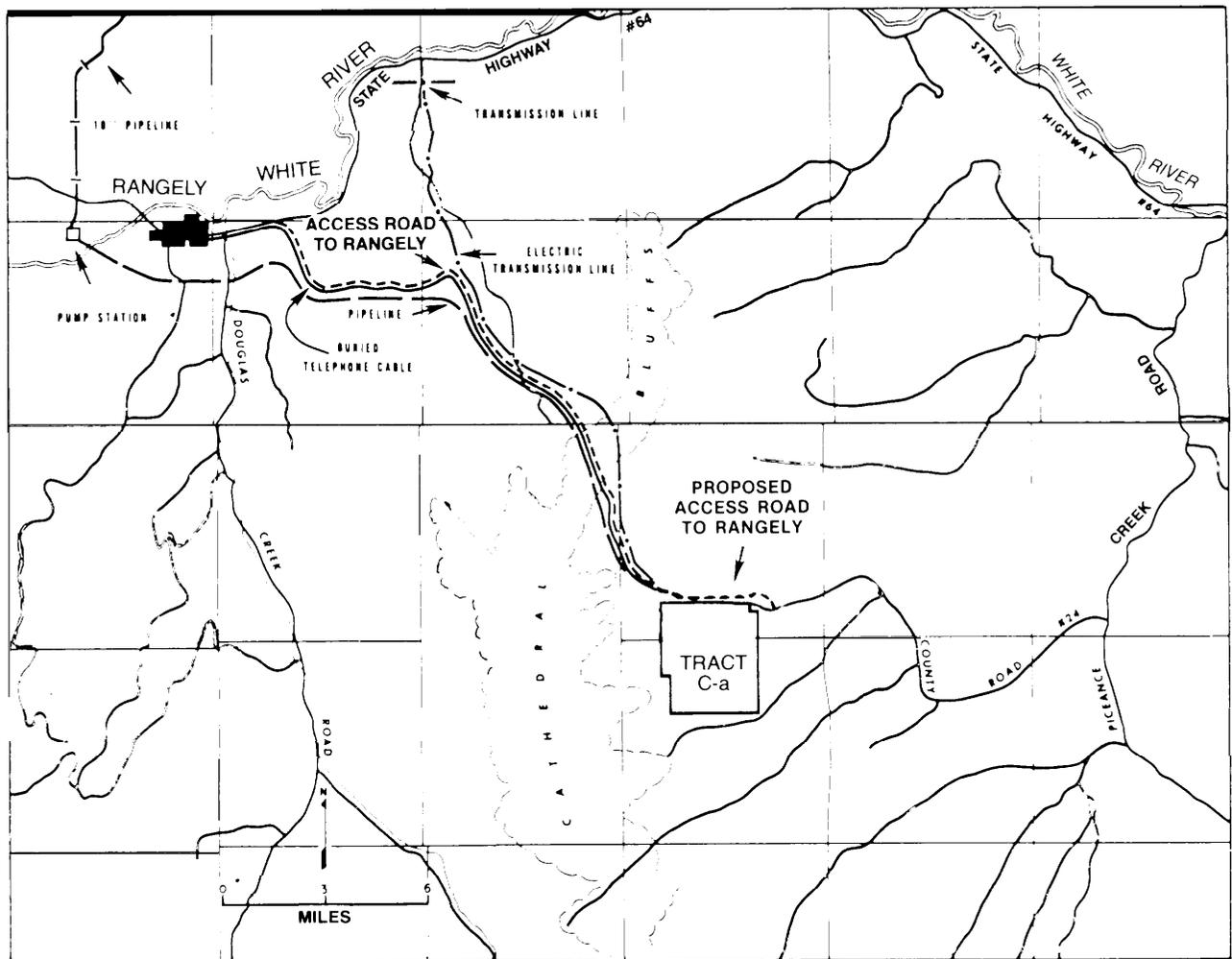
cal; if the C-a tract begins production and the road is not available, permanent employees will choose to live in Meeker or Rifle, both of which are now closer. Without this access, the opportunity to allocate some of the county's growth to the Rangely area will be forfeited.

MEEKER

Meeker grew about 15 percent between 1970 and 1977; its estimated population in 1979 was 2,250 to 2,300.⁶⁷ The community's physical infrastructure (e.g., water, sewer, streets), when current improvements are completed, could support between 4,000 and 5,000 residents; this figure may be reached in 1982 or 1983. However, the growth rate could accelerate. For instance, the draft EIS for the proposed Superior development, in projecting cumulative growth for its own and seven other energy projects,⁶⁸ places Meeker's population at 5,077 in the first year of operation, a doubling of the present estimated population in one calendar year. Even this projection could be low, since there are more than this number of possible projects under consideration by different industries for the area.

Of the needs identified by local officials, 55 percent are for public facilities and services, 15 percent for the schools, 19 percent for recreational projects, 9 percent for day care and senior citizens' support, and 2 percent are for hospital projects. Housing so far has kept up with demand. In the immediate area, four subdivisions are under construction, and a mobile home park has been approved. Under review, but not yet approved (in late 1979), were another mobile home park and a number of smaller subdivisions, none of which is presently within the Meeker water service area. Furthermore, the town is presently committed to the subdivisions now being built for 100 percent of its available water taps. Although the streets within the large subdivisions will be built by the developer, the town must provide the main arteries to those areas. The wastewater treatment plant is committed almost to capacity, and planning has started for its expansion.

Figure 74.—Area of Proposed Road From Rangely to Oil Shale Tract C-a



SOURCE 1977 Ad Addendum to the Rio Blanco Oil Shale Project Social and Economic Impact Statement.

The construction of water and sewer facilities is an example of the kinds of projects requiring adequate leadtime. If Meeker fails to begin preparing to expand its water supply and sewage treatment capacity now, it will not be able to absorb increased growth in 3 to 5 years. These kinds of improvements also serve as examples of the financing difficulties faced by rural towns. In constructing its present water system Meeker created a \$2.4 million debt that requires an annual debt service equivalent to 20 mills of the property tax levy.

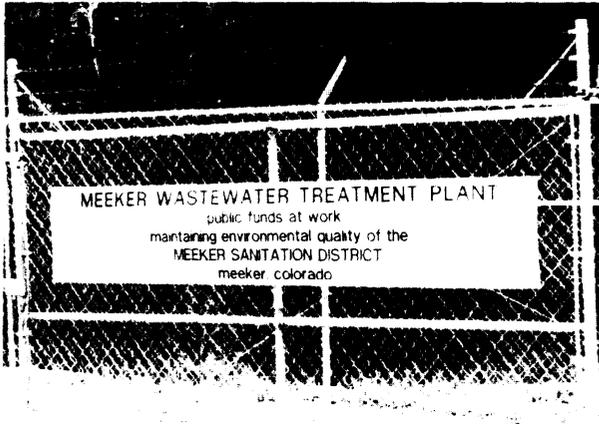


Photo credit: OTA staff

Approximately \$760,000 will be required to expand the storage capacity of the water system and \$2.5 million to upgrade the wastewater treatment plant. Thus, the city is facing a potential additional debt of over \$3 million in the next 3 to 5 years.

Meeker also reflects some of the administrative difficulties faced by growing towns. Colorado's statute, which restricts spending by municipalities (except home-rule cities) to a 7-percent increase over the annual property tax revenues,⁶⁹ means for Meeker that the maximum the town can increase its spending is about \$3,000 per year. Recently, the annual inflation rate has approached 16 percent, which makes such a small increase essentially nil in real revenues. The statute does provide for some administrative relief with the

approval of the State DLA but an application for an exemption filed by the city in 1976 was turned down. A manpower shortage plagues the city government. During the summer, when demands for labor are highest, the town has used inmates from the jail for assistance. According to the town manager, all of the municipal government staff but two are paid salaries lower than the HUD poverty guidelines for rural Colorado.⁷⁰

Overall the incidence of symptoms of social stress has not been increasing at the rate seen in other towns. A shift in the types of crimes committed has been noted, with increases in thefts, bad checks, and drug-related incidents; and a rise in the number of runaways has occurred in recent years. The number of cases reported by the police has increased at a faster rate than the population growth. "The hospital outpatient services are operating at capacity; an additional emergency room and laboratory are pressing needs. The school district is operating below its total capacity but some of the individual schools are full. A new elementary school will be needed between 1981 and 1982.

Attitudes about growth have been divided. In a survey conducted in 1974, 35 percent of the respondents agreed and 53 percent disagreed with a statement that the majority of growth from resource development should occur in Meeker. The town manager said in 1979⁷² that he felt the community wishes enough growth to pay the indebtedness incurred by construction of public facilities and to provide new amenities such as a larger supermarket and expanded recreation facilities.

RANGELY

Rangely finds itself in the paradoxical position of desiring additional growth but foiled in its efforts to obtain it. The biggest difficulty has been gaining improved access to oil shale activities. The proposed road to tract C-a was discussed above. Rangely's earlier experiences with oil and gas booms have made the town receptive to energy development and the residents feel that growth from an ex-

panded oil shale industry would be beneficial.

In addition to the access road, a dozen projects are judged to be needed by 1985. Half of these are for public facilities, such as a water supply pipeline to areas of new home construction. With improvements, the water system could serve a population of about 11,000 and the sewer treatment facilities are adequate to serve 10,000 people if the sewer mains can be upgraded. Because of the need for these improvements, however, the capacity of the town between 1985 and 1990 is estimated at only 6,000 residents.⁷³ Like most rural health care facilities, the Rangely Hospital has had to defer some maintenance and equipment needs in order to meet operating expenses but will have to take care of them before services can be provided for a larger clientele.

Recent school construction has provided sufficient capacity to absorb more pupils, but this again reflects Rangely's paradox. If the

town is unable to attract more families, the expansion of the schools will leave the buildings half-full and the remaining residents burdened with the debt of the expansion. The optimism of the citizens is reflected in their willingness to approve construction of a new indoor recreation facility that opened in the late spring of 1979.

The Rangely area has a strong feeling of identification with eastern Utah. The town is located about 15 miles east of the border. It is a little over 45 miles to Vernal, Utah, less than the distance to Meeker (57 miles) and to Grand Junction (85 miles). The road to Grand Junction goes over Douglas Pass (8,628 ft), making the route less appealing than the flatter highway to Utah. For these reasons, it is easier for Rangely residents to travel to Vernal. Colorado officials have sometimes acted in a way that the residents view as reinforcing their links with Utah; it took about 40 years to get the State to build the road over Douglas Pass. If the region experiences rapid



Photo credit OTA staff

Recreational facility in Rangely, Colo.

growth from oil shale development, the feelings of being ignored could add to other negative impacts. Moreover, if the oil shale activities are in Utah but the workers live in Colorado, a prime example of the problems of jurisdictional mismatch will occur.

In sum, Rio Blanco is the least populated county with the most limited highway system. Planning is well advanced with provision for extensive community participation. Some urgent needs, such as improved access to the Federal oil shale tracts, have not been met with as rapid a response as the local citizens might have wished; the State legislature has been reluctant to appropriate the large sums necessary for these projects. Rangely desires growth but will not receive much if a road to tract C-a is not constructed; Meeker is less inclined to have more growth than it has already gotten from coal development, yet may have to absorb new population from oil shale activities.

Summary

The socioeconomic consequences of oil shale development depend, among other things, on the location of the activities. Increased development of the private lands along the southern rim of the Piceance basin will lead to growth in Garfield and Mesa Counties and the communities of the Colorado River valley. Additional activity on the Federal lands in Rio Blanco County will mostly affect Meeker and Rangely, although Rifle could grow as well from this expansion. In Moffat County, Craig could be influenced by activities in the northern section and, if development occurs in Utah, Dinosaur and Rangely would be directly affected. Growth will tend to concentrate in established communities where services are already available. The limited surface transportation system will also foster concentration. In Rio Blanco County it is encouraged by a zoning policy that is intended to direct growth to Meeker and Rangely.

The needs by county and community between 1980 and 1985 are summarized in ta-

ble 102. The table shows clearly where the local leaders see the greatest constraints on growth: water supply systems for the municipalities, schools, and medical and health services and facilities. Several towns indicate a need for more personnel. Rifle and Meeker are the communities with the largest number of priorities. Assuming that the projects now underway are completed, Rifle should be able to absorb, between 1985 and 1990, up to 10,000 people, The other Garfield County communities in the oil shale vicinity could accommodate about 7,000 and the rural areas between 1,500 and 2,000 persons. If construction were started immediately, the new town of Battlement Mesa might house 2,500 people by 1985. In Mesa County, De Beque might be able to accommodate a total of 700 to 1,000 but most workers from the southwestern part of the Piceance basin will probably reside in the Grand Junction area. In Rio Blanco County, both Meeker and Rangely are judged to be capable of providing for 6,000 persons apiece, " A total of 2,000 people might live in the rural areas. Altogether, by 1985 Garfield County could accommodate about 21,000 and Rio Blanco about 14,000, for a total of 35,000 residents. (See table 103,)

Other than the planning efforts of CWACOG, no systematic evaluation of the full range of consequences for the entire region is being undertaken. For example, the draft EIS for the proposed Superior Oil Co. project⁷⁵ discusses, in the section on cumulative impacts, seven other activities that might interact with the Superior development. However, a total of 30 energy-related projects are identified by CWACOG and impact studies as possibly affecting the region. Similarly, planning documents give attention to individual counties or communities but do not address areawide problems in detail. For instance, the relationships and responsibilities of local, State, and Federal government agencies are critical for communities facing boomtown conditions, but they are not dealt with in any of the plans. Jurisdictional mismatches also are seldom addressed. Development on pri-

Table 102.—Priority Needs Identified by Oil Shale Counties and Communities, 1980-85¹

Source of request	Municipal facilities	Public buildings	Water	Sewer	Public facilities	Flood control	Roads and streets	Housing	Schools and education	Public safety	Medical and health	Community services	Parks and recreation	Miscellaneous ^b
Regional									•		•			•
Mesa County	•	•	•	•	•				•					
De Beque			•											
Garfield County		•	•		•		•		•		•	•		
Grand Valley			•	•					•				•	•
New Castle			•											
Riffler	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Silt	•	•	•					•						•
Rio Blanco County					•		•		•	•	•		•	•
Meeker	•	•	•	•		•	•		•	•	•	•	•	•
Rangely	•	•	•		•	•	•		•	•	•	•	•	•
Moffat County	•	•	•	•	•		•		•	•	•	•		
Dinosaur			•										•	

¹See ref 62 for listing of sources of needs.
^bIncludes support for planning infrastructure and personnel needs of local agencies.
 SOURCE: Office of Technology Assessment

Table 103.—Actual and Projected Population and Estimated Capacity of Oil Shale Communities in Colorado

Location ^a	Population		
	1977 census ^b	1980 projected	1985-90 capacity ^d
Garfield County			
Riffler	2,244	4,362	10,000
Silt	859	1,211	2,800
New Castle	543	831	1,000
Grand Valley	377	589	3,000
Battlement Mesa ^e	—	198	2,500
Other,	—	—	1,700
Subtotal	4,023	7,191	21,000
Rio Blanco County			
Meeker	1,848	2,779	6,000
Rangely	1,871	2,223	6,000
Other	1,381	1,542	2,000
Subtotal	5,100	6,544	14,000
Total	9,123	13,735	35,000

^aDoes not include Mesa or Moffat Counties both of which are more distant from the area of development.
^bActuals from a special U.S. census.
^cEnd of the year projections by the Colorado West Area Council of Governments.
^dEstimated by OITA from various planning and needs assessments documents, assuming completion of currently planned projects (e.g. housing, water and sewer system expansions, street and road improvements, etc.).
^eA new town construction anticipated to begin in the early 1980s.
^fIncludes only the immediate oil shale vicinity.
 SOURCE: Office of Technology Assessment

vate oil shale holdings in Garfield County could cause rapid growth in Mesa County, and workers in Utah could reside in Colorado; neither problem has been systematically analyzed.

Potential Effects of Accelerated Development

The response of a given community to growth depends on a number of elements. Among these are:

- the absolute numbers and abruptness of the population influx;
- the attitudes of both long-term residents and newcomers;
- past experiences with boom and bust cycles;
- the ability of local political structures to prepare for population growth; and
- the availability of assistance—financial and other—for mitigation of impacts.

Whether the consequences of growth are favorable or unfavorable depends on whether the people can adapt to the stresses accompanying change. This ability is unique to each community and must be viewed as part of a dynamic set of complex events. Conclusions about the possible effects of future oil shale development must recognize the complex and changing nature of the different communities and of the events impinging on them.

Industrial expansion in western Colorado will have positive as well as negative consequences. In the economic sphere, a primary benefit will be increased economic activity. The direct effects of increased employment, higher wages, and stimulation of support industries and services would be felt throughout the region. Both the public and private sectors would benefit from industrial and services expansion. Towns and counties should enjoy a broader tax base. A sense of identity and pride, combined with an anticipation of the advantages of growth, have already been manifested. Planning activities, such as the preparation of the master plan for Rangely, have contributed to the public's expectations for the future. The successful operation of the task forces that propose solutions for growth problems is tangible evidence of increased sociological and psychological cohesion. The confidence that many local officials express in their community's ability to deal with growth is also an indication that, to date, the social consequences of oil shale development have been positive. The involvement of the oil shale developers in growth management efforts shows industry's responsiveness to the social effects of its expansion.

Oil shale development has been and will continue to take place concurrently with other activities, especially energy-related ones, such as coal, uranium, oil, and gas production. Dealing with the cumulative effects of all the growth may prove difficult. In addition, the nature of new oil shale ventures is unclear. Factors of particular importance for social and economic adjustment will be the:

- number—how many new oil shale developments occur;
- size—how large the facilities will be;
- location—where shale mining and processing activities take place;
- timing—when each is built and how this relates to other development;
- rapidity—how quickly any new ventures are built; and
- type—the nature of the technology and ancillary processes chosen.

The position of the State regarding both oil shale development and social and economic impact mitigation is also not certain. Until more is known about these factors, the exact nature of the population in-migration that will accompany new development cannot be adequately projected, nor can the full dimensions of the consequences, both positive and negative, be forecast. So long as oil shale development continues according to the plans already laid, the people of oil shale country should be able to adjust to the resulting growth. Only if expansion occurs suddenly or to a greater degree than now planned will boomtown consequences occur. (See ch. 3 for a further discussion.)

Issues and Policy Approaches

Summary of Issues

Identifying and Evaluating Social and Economic Impacts

In the usual course of economic development, Government assistance in coping with the consequences of growth is not a prime concern. One question underlying energy development is the distinction between effects that can be handled by local communities—that is, those that can be considered a normal concomitant of development; and those that are problems because they cannot be readily solved by local resources—boomtown effects. An example of criteria used to make this distinction is found in section 601 of the Powerplant and Industrial Fuel Use Act of 1978. These include increased employment of 8 percent or more per year in coal or uranium activities, a resulting or projected housing shortage, and inadequate State and local financial resources to meet needs over a 3-year period.

Thus far, Federal agencies have assisted in the identification of boomtown conditions mainly through data-gathering and information-sharing activities. With respect to evaluation, the position is that “local communities and counties must take the initiative to become involved in assessing, planning for, and mitigating socioeconomic impacts”⁷⁶

The process of evaluating impacts involves their classification as either positive or negative. This requires making value judgments about what is good or bad for particular individuals, communities, regions, and the Nation. Often there are conflicts—what is seen as good for the Nation may entail difficulties for individuals or disruptions of communities. Additionally, what is judged as a positive impact for one group may appear as a negative one for a different group.

The process is further complicated because the basis for distinguishing positive from negative impacts is seldom clearly delineated, and the assumptions underlying the

definitions of the two classes are rarely spelled out. As an illustration, concepts such as the “degradation of the quality of life” are used; and a variety of indices, like an increase in the number of visits to a mental health clinic, are cited to support the finding of “degradation.” Yet there is hardly ever verification of the causal chain presumably linking rapid population influx to the indices and thence to perceived changes in the quality of life.

Finally, several of the most important boomtown consequences are hard to measure (for example, the ability of newcomers to adjust to an established community); and the changes in the social structure may not be manifested immediately. A question that has not received great attention is whether the long-term basic changes are more important than the immediate ones occurring at the onset of a boom.

The debates about oil shale development include conflicts involving these kinds of value judgments. On the one hand is the need for synthetic fuel production; on the other are the boomtown consequences for communities. Who participates in the definition of positive and negative impacts and in the resolution of the value conflicts that emerge is an important issue. At present, in Colorado, local groups play a large part in this evaluation. They identify the impacts they believe will affect their communities, decide which ones are severe enough to require corrective action, and participate in the decisions to allocate resources for mitigation. Federal programs designed to assist communities must recognize what has been done to date and face the issue of the allocation of responsibility for these decisions.

Determining a Maximum Growth Rate

How rapidly can the communities expand? How much growth can be accommodated before a community breaks down? The social and economic impacts of oil shale develop-

ment will depend on the total number of newcomers, the rapidity with which they come into the area, the size of the industry's expansion, its location within the oil shale region, and the ability of the communities to prepare. The maximum amount of growth the different areas can accommodate without incurring boomtown consequences is a critical question.

Attempts to determine a maximum rate have discovered that generalizations are difficult to derive and that the capability to adjust to rapid growth turns out to be highly site specific. Whether communities will suffer from rapid growth or take it in stride depends on a unique set of factors within each individual community, for example, the threshold when negative impacts outweigh positive ones. Since the positive and negative impacts may vary from one town to the next, establishing this threshold is highly dependent on local conditions. In the past decade, identifying and measuring the social changes that accompany rural energy development have received increasing attention. The results have been an expansion of the factual base describing these changes, and a more systematic framework for seeking to explain them. To date, however, there are neither sufficient facts nor theories to understand fully why one town becomes vulnerable to boomtown impacts but a similar one does not.

No systematic study of the factors determining a maximum growth rate is being carried out for the oil shale communities. The groups presently involved in growth management and planning would benefit from a determination of thresholds of growth for their individual communities and policy makers could use this information when considering the rate of future development. The population of the Colorado oil shale region was about 10,000 in 1977 and is projected to be about 14,000 by the end of 1980. OTA estimates that the communities could accommodate up to 35,000 total residents during the period from 1985 to 1990. This assumes that construction of the new town of Battlement Mesa in Garfield County is started in the near

future and that the existing communities can continue to improve their physical facilities and services. Boomtown symptoms could emerge at any time, however, if individual and social stress prevented adjustment to the growth.

The Mitigation of Impacts

Solving the problems of rapid growth involves local, regional, State, and Federal agencies. Questions about the role of the Federal Government fall into two categories:

- the extent to which the Federal Government should be involved, and
- the form the involvement might take.

The first category raises the fundamental question of whether the Federal Government should be involved at all. The extent and nature of Federal involvement in impact mitigation are controversial. On the one hand it is argued that social and economic impacts are State and local problems which should be viewed as the inevitable consequences of industrial development. On the other hand is the position that national requirements are the root causes of the local impacts, therefore an expanded Federal role is appropriate. Several Western States have taken the stance that expanded domestic energy production is a national goal and thus, for reasons of equity, the Federal Government should assume a more direct role in the alleviation of negative impacts from this development.

The second category deals with the nature of Federal involvement. One position states that present programs are sufficient but that the amount of money they provide needs to be increased. Another is that Federal regulation could be used to mitigate impacts by, for example, pacing industry's growth rate through leasing policies. A third position is that the Government should be directly involved in mitigation programs that use Federal funds.

The question of the effectiveness of mitigation programs arises as well. Some observers contend that the success of oil shale mitigation processes to date is proof of their effective-

tiveness. Others maintain that the processes have never been adequately tested because rapid, large-scale development has not yet occurred, and that existing programs could break down under such circumstances. Most questions about the effectiveness of the processes relate to intrastate issues. For example, it can be questioned whether the legislative approach to disbursement of the Oil Shale Trust Fund deals adequately with the desires of the oil shale counties. The Federal Government could respond to such questions by, for example, providing funds directly to the communities. The desirability of such an action is a topic of current debate, however.

Increased Federal assistance probably will be required if the region experiences sustained rapid growth. This could come about from accelerated oil shale development, but is more likely to be the consequence of combined growth from several industries. Aside from the planning efforts of CWACOG, which are limited to northwestern Colorado, no systematic evaluation of the full range of effects from an increase in all types of industrial growth on the entire region is being undertaken. Thus, it is difficult to determine which types of Federal assistance might be the most productive.

Policy Approaches

Confronting the social and economic effects of an expanding domestic energy industry involves policies for all parts of the Nation. Concern for the consequences of oil shale development, however, for the time being centers only on northwestern Colorado, east-central Utah, and southwestern Wyoming. In addition, although the impacts themselves are basically similar regardless of the geographic region, the responses of particular communities can differ significantly depending on the State and location involved. Flexible policies are best, given this situation. The following discussion is concerned with policies that bear most directly on the effects of a larger oil shale industry.

Background

The initial action responsible for consideration, in public policy decisions, of the socioeconomic effects of Federal projects was the National Environmental Policy Act of 1969 (NEPA).⁷⁷ It requires Federal agencies to consider environmental factors in decisions involving "major Federal actions significantly affecting the quality of the human environment."⁷⁸ The broad wording of the Act has led to a considerable amount of litigation. In these court cases,⁷⁹ NEPA has been interpreted as granting authority for the imposition of conditions to mitigate adverse social as well as environmental impacts. As a result of the litigation, and subsequent regulations issued under NEPA, socioeconomic considerations have of late received greater emphasis in the preparation of EISs.

The Coastal Zone Management Act Amendments of 1976⁸⁰ set up a program of assistance for communities experiencing impacts from Outer Continental Shelf (OCS) energy development. Loans, loan guarantees, and grants are available to States and communities where an energy facility planning process has been established under the Coastal Zone Management Act of 1972⁸¹ (CZMA). Site plans must include the identification and mitigation of anticipated adverse impacts from OCS-related development. The program is tied closely to land use planning mechanisms that State and local governments are required to develop if they participate in the coastal zone management program. The impact assistance portion depends upon the initiative of the States in meeting the CZMA requirements; Federal involvement is therefore indirect, in the sense that the policy makes Federal funding contingent upon the establishment of State and local land use planning processes.

In March 1978, DOE published for the Energy Impact Assistance Steering Group a Report to the President—Energy Impact Assistance.⁸² The Steering Group, composed of representatives from Federal, State, local, and

Indian Tribal governments, was established following a meeting of several Governors with the president in mid-1977. At that time the Governors expressed concern for potential adverse results from the 1977 National Energy Plan. Four policy options were presented representing “different points along a continuum ranging from minimal new efforts to undertaking major program reform and investment of substantial new Federal funds,] (See table 104.)

In an effort to pull together the various Federal programs that can assist communities, the Region VIII FRC has created an Energy Impact Office. Its establishment was a direct response to recommendations of the National Governors Conference and of the General Accounting Office (GAO).⁸⁷ A GAO report, published in 1977, concluded that at that time the need for additional Federal assistance to impacted communities had not been demonstrated. Among its conclusions, the report stated:

Rocky Mountain State and local governments should be primarily responsible for providing facilities and services prior to or concurrent with population increases . . .

It is not industry’s responsibility to provide the facilities and services needed because of energy resource development. But industry does have a strong and continuing responsibility to communicate its plans to State and local governments, as soon as possible, and to establish and maintain a continuing liaison with these governments,

The Federal Government should continue to provide some assistance . . . (but) the need for additional Federal assistance at this time has not been demonstrated.

GAO believes there should be some assurances that impacted communities will receive funds available to mitigate the socioeconomic impacts of energy resource development.⁸⁵

A theme running through each of these Federal policy documents is that the Federal role regarding the social and economic effects of energy development should be primarily indirect assistance. Examples are pro-

viding funds to the States and improving the delivery of existing Federal programs (e.g., the establishment of a “one-stop shopping center” where local officials can go to determine whether their towns are eligible for the many Federal programs already available).

A recent departure from this theme is found in the Energy Impacted Area Development Assistance Program that was enacted in the Powerplant and Industrial Fuel Use Act of 1978 (sec. 601).⁸⁶ This program, administered by FmHA, is designed “to help areas impacted by coal or uranium development activities by providing assistance for the development of growth management and housing plans and in developing and acquiring sites for housing and public facilities and services.” The probability of greater Federal involvement in the direct amelioration of impacts is reflected in the amendments to the Powerplant and Industrial Fuel Use Act considered during the fall of 1979. A review of the problems, legislative issues, and proposals being considered by the 96th Congress is available in a Congressional Research Service (CRS) study titled *Energy Impact Assistance: A Background Report* prepared for the Senate Committee on Energy and Natural Resources.⁸⁷

In general, the Western States have adopted policies that supplement and fill gaps in Federal programs. Colorado provides funds, from Federal revenues and a State severance tax, and technical assistance to counties and towns with growth problems. The State’s position is that local initiative must be central in the mitigation process. As a result, sentiments are strong among leaders in Colorado’s oil shale communities that local government should play a significant part in the control and management of growth.⁸⁸ For a number of years, because of the delays in oil shale development, these leaders were skeptical about its eventual occurrence; now they are fearful that a national crash program might ignore the plans that they have so carefully laid and cause a population surge that the communities could not absorb. Utah has

Table 104.—Selected Policy Options, 1978 Report to the President

	Option A	Option B	Option C	Option O
Need areas	Expansion of industry role and modification/reprioritization of existing programs	Enhancement of State, local, and Tribal capabilities through new initiatives and programs	Modification and expansion of existing programs to assure greater Federal share of long-term costs	New Federal grant program to pay long-term costs
Information	implementation' or ' national energy information systems by DOE with State/local/Tribal access to certain NEIS data Encourage States to require in-m- industry release of employment, population, and siting data for proposed projects as precondition for receipt of certain State/ local permits (water, construction, etc)	Option A, plus have appropriate Federal agencies give prior notification to State/localities, and Tribes of BLM, OCS leasing plans, decisions and other data related to industry projects proposed to Federal agencies, improve conformance with NEPA and A-95 review processes	Option B, plus establishment by DOE of a new information system to gather and disseminate impact assistance related data from energy developers (\$1 5 million).	Option C
Participation in decision making	Continued ad hoc efforts by State/ local governments and Tribes to impact Federal decision processes on energy resource development and project siting.	Issue Presidential Executive order requiring Federal agencies to provide for State/local/Tribal involvement in all energy development decisions affecting their jurisdictions, and to provide for consideration of the findings of the impact assessment teams prior to final decisions.	Option B, plus establishment of due process mechanism to review appeals of Governors/Tribal officials.	Option C
Planning and management	Conduct joint Federal/State/local/Tribal impact assessments Provide Federal technical assistance and information to communities which are now, or expected to experience energy development Increase funding under selected existing planning program by \$20 million and target to energy impact areas	Option A, except Incorporate new planning monies into proposed comprehensive State energy planning and management bill, and specifically target new funds to support State/local/ Tribal participation on assessment teams and ongoing impact-related capabilities. A set-aside of funds for Tribes would be provided. Also, bonus funds for States with energy facility - siting mechanisms.	Option B, plus require all Federal energy decisions to be compatible with approved State impact mitigation strategies	Option B • Establish Federal/State assessment teams as specified. • Federal assistance to State to develop facility - siting mechanisms and to provide initial and second-round planning grants (\$1 5 million). • Federal compatibility requirement
Coordination of assistance programs	Expand the role of the Federal Regional Councils in coordinating and packaging assistance funds to energy-impacted areas, make greater use of joint funding authority.	Option A, plus designate DOE as lead agency to oversee and support coordination of programs at the regional level through an interagency board	Option B, plus issue Executive order mandating appropriate Federal agencies to support FRC efforts and to give priority consideration to funding requests channeled through this mechanism	The Federal agency designated as the lead assessment agency would be responsible for coordinating all relevant Federal programs,
Financing	Modify requirements of selected existing programs to provide for eligibility and priority for funds to impact areas (within existing statutory limits) Increase funding of selected programs by \$30 million to offset reduction in funds for other priority needs (e g , urban poverty) Give priority to States, etc , securing industry cost-sharing Possible amendment to Federal tax code to encourage prepayment of taxes by Industry	Establish Federal loan and loan-guarantee programs in EDA with forgiveness provisions and competitive interest rates to be used by States, communities, and Indian Tribes (\$75 million) Fund sec. 306 of the proposed Coal Conversion Act (\$60 million) Give priority to States, etc , with energy facility-siting mechanisms	Option B, plus increase EDA funds by additional \$50 million and authorize grants as well as loan/guarantees. (\$125 million plus \$60 million for 306). Priority to States, etc , with increased commitment of State/local/ Tribal revenues and facility siting procedures. Suboption Consolidate Coastal Energy Impact Program and sec. 306 program into EDA to create single, flexible program to relet Infrastructure needs in all States	Establish a new program to provide grants to the States for. -State revolving funds (\$200 million) -Highways construction and railroad grade separations. -Mismatches (\$10 million) (Interstate and State/ Tribal) -Loan guarantees (\$15 million). Fund housing support in sec. 306 but expand and augment to cover energy facility construction and 011 shale development (\$60 million).
Annual authorization	\$50 million	\$160 million	\$212 million	\$300 million

SOURCE Department of Energy DOE /IR-0009, UC 13.

been faced with rapid growth from coal and uranium development, and has not planned extensively for oil shale activities. The State created a Community Impact Account in 1977 to provide loans and grants to areas impacted by mineral resource development. Because it is the only funding source in the State designed to respond to problems associated with energy development, requests for help have far outstripped the available monies. Wyoming does not anticipate consequences from shale development in the near future. The State has an array of mitigation programs dealing with other energy industry impacts that could be adapted to growth problems from accelerated oil shale activities.

Evaluation of Existing Policies

The diverse nature of present policies, Federal and State, makes their overall evaluation difficult. State policies vary: Colorado places emphasis on local initiative and advocacy, whereas Utah and Wyoming emphasize more centralized State determination of needs and allocation of funds. At the present time, there is no single Federal policy with respect to the social and economic effects of energy production. Some programs are operating that address certain aspects of these effects but, at present, none speaks directly to the general impacts that may come with synthetic fuel development nor to the specific effects of accelerated shale oil production. A limited amount of assistance is available through avenues not specifically designed to deal with energy development impacts, but these Federal programs each have different emphases and modes of providing help. While they may be adequately fulfilling their policy mandates, the specific nature of the mandates means that the entire range of problems is not being addressed. Additionally, even though steps have been taken to consolidate the fragmented nature of Federal programs, effective implementation of a more uniform set of practices has yet to reach the oil shale communities.

An increasing recognition of the problems caused by national energy decisions has led

to several reviews of existing policies and to suggestions of ways to achieve a more unified policy. Congress has had before it proposals for a comprehensive inland energy impact assistance program, but to date none has been enacted. Up to the present, return to the States of portions of the lease, rental, and bonus payments for development on Federal lands has been the major Federal contribution to mitigation efforts.

Colorado has an ambitious set of policies and programs to assist with impact mitigation. Overall, these efforts have been successful in helping the oil shale counties and municipalities to get ready for shale development. The ability of existing policies to deal with a large or sudden population influx, such as might occur with the rapid expansion of the oil shale industry, is as yet untested. The uncertainties about the specific growth of the industry make it difficult to evaluate whether any policies—Federal or State—will be adequate to deal with the effects of rapid expansion of the industry.

Approaches to Impact Mitigation

There are three approaches available to Congress when considering the social and economic effects of oil shale development. The impacts can be viewed:

- as part of the consequences of all kinds of energy development;
- as an aspect of specific energy initiatives; or
- as the result only of shale development.

From the perspective of the first approach, oil shale impacts would be included along with the problems accompanying all domestic energy efforts. As noted above, Congress has recently considered bills providing comprehensive assistance for these problems, and programs for oil shale could be in such legislation. The second approach would place shale impacts along with those from other major national efforts. Proposed amendments to the Powerplant and Industrial Fuel Use Act of 1978 are illustrative. These amendments are directed to the adverse effects of major

energy developments, which could include oil shale. They authorize grants, loans, loan guarantees, and payments of interest on loans, and propose an expediting process for present Federal programs as well as an inter-agency council to coordinate Federal assistance. The third approach sees the effects as the result of oil shale development alone. In this case, specific language dealing with socioeconomic impacts could be included in bills providing for the development of oil shale resources.

Regardless of the approach adopted for oil shale, there are three options that Congress can consider to address social and economic impacts.

CONTINUATION OF PRESENT PROGRAMS

Under this option, Federal assistance would continue to emphasize revenue sharing and technical assistance. Funding through existing channels, such as the Mineral Leasing Act, as amended, would be the major mechanism. Certain other existing Federal programs, not now designed to deal specifically with socioeconomic impact mitigation, could be redirected. For instance, EPA water and sewer grants could be accelerated, with additional appropriations made available and limited to impacted communities. Restrictions on existing programs could be modified. An example is Federal housing programs, now restricted to projects for low- and moderate-income families, that could be provided to rural communities undergoing rapid growth regardless of local income levels.

The advantages of this option are that it would require only minor adjustments to existing laws. Mechanisms for delivery are already in place. Flexibility would be maintained since the focus would be on already established programs designed to meet a variety of needs. The disadvantages include the possibility that the amount of aid might not be adequate to meet the demands of severely impacted communities. In this case, appropriations would have to be increased for some programs now being held at particular fund-

ing levels. The fragmentation of programs, now viewed by some States and localities as a barrier to efficient delivery of Federal aid, probably would not be reduced.

INCREASED FEDERAL INVOLVEMENT IN GROWTH MANAGEMENT

This option would emphasize regulation. Present Federal revenue sharing would continue. Several possibilities exist for increased growth management participation. Consideration of social and economic effects on adjacent communities could be made a part of executive agency criteria when selecting Federal lands for energy mineral leasing. In this case, given natural resource deposits of approximately equal value, leases would be made available only in areas where the socioeconomic impacts could be minimized. Also, the number and timing of leases could be adjusted to take into account the ability of nearby communities to absorb growth. Finally, the lease provisions could include mandatory participation of lessees in mitigation efforts.

Greater involvement of Federal agencies in monitoring socioeconomic impacts and in providing assistance to mitigation efforts is another alternative. For example, the regulatory activities of the Area Oil Shale Supervisor's Office could be expanded to include monitoring social and economic indices in off-tract communities. Attention could be given to difficulties not now being systematically faced, such as interstate jurisdictional problems between Utah and Colorado. The Region VIII Energy Impact Office could have a field representative permanently stationed in oil shale country to provide the services of FRC locally. This representative could provide technical assistance to area planners and could address problems they are too busy to consider now, such as anticipating the post-boom period. Increased technical assistance could also address the problems of defining and identifying boomtown conditions. A determination of the maximum growth communities could sustain without experiencing severe disruption would be valuable for policymakers at all levels.

Identifying and evaluating social and economic impacts, determining a maximum growth rate for specific sites, and coordinating Federal programs are needed in all parts of the country experiencing energy-related growth. Thus, actions to deal with these problems would be of nationwide value. For this reason, R&D could be undertaken by any of several agencies on a national basis, and would not necessarily have to be limited to the oil shale region.

Among the advantages of this option is that it would supplement existing mitigation programs already established by local and regional entities. It would provide a link between Federal decisionmaking bodies and State and local agencies responsible for growth management. Access to Federal programs would be enhanced. Among the disadvantages are the increased bureaucracy needed to implement the option, and the possibility that local individuals would perceive the Federal efforts as increased infringement on their lives. Energy development companies would most likely object to additional lease restrictions and to required participation in mitigation programs. Executive agencies might find implementation burdensome.

EXPANSION OF FEDERAL PROGRAMS FOR IMPACT MITIGATION

Under this option, programs already enacted would be expanded or new ones

adopted. The Powerplant and Industrial Fuel Use Act of 1978, section 601 program, is the obvious candidate for extension. Under this Act,⁸⁹ Federal assistance was provided for areas experiencing rapid growth from coal or uranium production. The assistance is aimed at improved planning for growth management, and for land acquisition for housing and public facilities development. Expansion of the program would include areas affected by growth from industries other than coal and uranium producers, and could encompass a wider range of problems than growth management planning and land acquisition. A bill to expand the section 601 programs is currently under consideration. *

The advantages of this option are that it expands an already existing program. The mechanisms for implementation are in place and have already been operating under the present law. Disadvantages include the need for increased appropriations to fund the various elements of the program and expansion of the Federal bureaucracy to carry out the Act's provisions. Some flexibility may be lost as uniform standards are applied to all States wishing to participate in the expanded program.

*S. 1699.

Chapter 10 References

¹For a discussion of current controversies about the early inhabitation of the North American continent, see Graham Chedd, "On the Trail of the First Americans," *Science* 80, vol. 1, No. 3, March/April 1980, pp. 44-51. For general information, see *Handbook of North American Indians* (Washington, D. C.: The Smithsonian Institution, 1979).

²Angelico Chavez (tr.), Ted J. Warner (cd.), *The Dominguez-Escalante Journal: Their Expedition Through Colorado, Utah, Arizona and New Mexico in 1776* (Provo, Utah: Brigham Young University Press, 1976).

This was Powell's second expedition to the Rockies. It followed a trail pioneered by Berthoud in 1861; Jim Bridger served as guide. Powell's wife accompanied the group and was the only woman to spend the winter. Powell made a trip in November, which he nearly didn't complete, to get supplies at Green River City, Wyo, Powell's Park, a few miles west of Meeker, Colo., was the site of the "Meeker Massacre" in 1879. Here, a group of Ute Indians shot and killed Nathan Meeker and several other workers at the Indian Agency. See Robert Emmitt, *The Last War Trail: The Utes and the Settlement of Colorado* (Norman, Okla.: Univ. of Oklahoma Press, 1954) and Marshall Sprague, *Massacre: The Tragedy at White River* (Boston, Mass.: Little, Brown & Co., 1957).

⁴The Ute Indians signed four treaties with the United States: in 1840, 1863, 1868, and 1880. See Gerald T. Hart, Leroy R. Hafen, Anne M. Smith, and the Indian Claims Commission, *Ute Indians II* (New York, N. Y.: Garland Publishing, Inc., 1974) and George E. Fay, *Land Cessions in Utah and Colorado by the Ute Indians, 1861-1899* (Greeley, Colo.: Univ. of Northern Colorado, Museum of Anthropology, Misc. Series No. 13, 1970). See also Emmitt, *Supra* No. 3.

⁵Range wars erupted in the latter part of the 19th and early decades of the 20th centuries when sheep and cattle raisers fought over the use of the rangelands. See James H. Baker and LeRoy R. Hafen (eds.), *History of Colorado* (Denver, Colo.: Linderman Press, 1927).

⁶In 1901, Roosevelt spent 5 weeks hunting mountain lion near Meeker; the party killed 14, of which the largest weighed over 220 lb and was over 8 ft long. In 1905, he returned for a bear hunt in the area south of New Castle.

⁷Bureau of the Census, *County and City Data Book, 1977* (Washington, D. C.: Government Print-

ing Office, 1978). See also Colorado Department of Agriculture, *Agricultural Land Conversion in Colorado* (Denver, Colo.: Resource Analysis Section, 1979).

⁸Bureau of the Census, *Congressional District Data Book, 93d Cong.* (Washington, D. C.: Government Printing Office, 1973).

⁹Frank G. Cooley, "The Growing Awareness of Oil Shale's Impact on Communities in Western Colorado," *Rocky Mountain Association of Geologists—1974 Guidebook to the Energy Resources of the Piceance Creek Basin, Colorado*, 171-3.

¹⁰[]Altogether, more than 20 studies were published between 1970 and 1977 dealing with one or another aspects of oil shale development. See, e.g., Oil Shale Regional Planning Commission and the Colorado West Area Council of Governments, *Profile of Development of an Oil Shale Industry in Colorado* (Rifle, Colo.: CWACOG, 1973), and Colorado West Area Council of Governments, *Oil Shale and the Future of a Region: A Summary Report* (Rifle, Colo.: CWACOG, 1974).

¹¹Alys Novak, "Oil Shale—1976/1977," *Shale Country*, vol. 2, No. 12, December 1976, pp. 2-6.

¹²Rio Blanco Oil Shale Project, *Social and Economic Impact Statement—Tract C-a* (Gulf Oil Corp. - Standard Oil Co. (Indiana), March 1976); an Addendum was published in May 1977.

¹³C-b Oil Shale Project, *Oil Shale Tract C-b Socio-Economic Assessment*, 2 vols. (Ashland Oil, Inc. - Shell Oil Co., March 1976).

¹⁴Colony Development Operation, *An Environmental Impact Analysis for a Shale Oil Complex at Parachute Creek, Colorado* (Denver, Colo.: 1974).

¹⁵Jonijane Paxton, "Whither Now, Battlement Mesa?" *Shale Country*, vol. 2, No. 6, June 1976, p.15,

¹⁶Western Environmental Associates, Inc., *Baseline Description of Socio-Economic Conditions in the Uinta Basin and Socio-Economic Impact Study of Oil Shale Development in the Uinta Basin* (Denver, Colo.: White River Oil Shale Corp., 1975).

¹⁷The five studies are:

- a. Department of the Interior, *Final Environmental Statement for the Prototype Oil Shale Leasing Program*, 6 vols. (Washington, D. C.: Government Printing Office, 1973),
- b. Rio Blanco Oil Shale Project, *Social and Economic Impact Statement—Tract C-a* (Gulf Oil Corp. - Standard Oil Co. (Indiana), March 1976), including 1977 Addendum,

- c. C-b Oil Shale Project, Oil Shale Tract C-b Socio-Economic Assessment, 2 vols. (Ashland Oil, Inc. - Shell Oil Co., March 1976).
- d. Department of the Interior, Final Environmental Impact Statement: Proposed Development of Oil Shale Resources by the Colony Development Operation in Colorado, 2 vols. (Washington, D. C.: Government Printing Office, 1975).
- e. Western Environmental Associates, Inc., Baseline Description of Socio-Economic Conditions in the Uinta Basin and Socio-Economic Impact Study of Oil Shale Development in the Uinta Basin (Denver, Colo.: White River Oil Shale Corp., 1975).

¹⁸Rio Blanco County Ordinances, sec. 1003; 1974.

¹⁹See Steve H. Murdock and F. Harry Leistriz, *Energy Development in the Western United States—Impact on Rural Areas* (New York, N. Y.: Praeger Publishers, 1979).

²⁰It is difficult to place a dollar value on the contributions of industry. In Wyoming, the Missouri Basin Power Cooperative (a consortium of REA electric cooperatives) estimates that it spent \$21 million in mitigation efforts in conjunction with the construction of the 1,500-MW Laramie River Station in Platte County. This included in-kind services; direct grants and revenue guarantees to towns, counties, and agencies; bond guarantees; and similar assistance. The cooperative believes it saved approximately \$50 million in costs by reducing employee turnover and by allowing the plant to be constructed on schedule. Furthermore, they anticipate recovering all but about \$3 million of the \$21 million outlay as the bonds are paid and other revenues become available. Eventually the amount spent for mitigation probably will fall between one-half and 1 percent of the total cost of the plant. (Personal communication from Dr. James Thompson to OTA, Nov. 5, 1979.)

²¹Col. Gen'l Ass'y, H.B. 1200 (1974, 2d sess.).

²²41 Stat. 437 (1920), as amended and supplemented, 30 U. S. C., sec. 181 et seq. (1976),

²³C.R.S. 1973, 34-63-104.

²⁴C.R.S. 1973, 34-63-104 (1).

²⁵C.R.S. 1973, 34-63-104 (2).

²⁶C.R.S. 1973, 34-63-101 and 102, as amended.

²⁷C.R.S. 1973, 34-63-102 and 39-29-110.

²⁸C.R.S. 1973, 39-29-101 through 114 (Supp. 1977).

²⁹Personal communication, Stan L. Albrecht to OTA, Oct. 16, 1979.

³⁰U.C.A. 1953, 63-51-1 through 4.

³¹U.C.A. 1953, 53-7-1 and 2; 65-1-64 and 65; and 65-1-115.

³²U.C.A. 1953, 73-10-8 and 73-10-23.

³³W.S. 35-12-101 through 121,

³⁴W.S. 9-1-129 through 136.

³⁵W.S. 39-6-412.

³⁶Personal communication, Dr. James Thompson to OTA, Oct. 16, 1979. An example of an imaginative program is the Wyoming Human Services Project (WHSP). The WHSP program trained human service personnel at the University of Wyoming campus and then placed the students in Wyoming boomtowns for field experience. After completing the program, many students found jobs in the communities and stayed to continue their service. See Judith A. Davenport and Joseph Davenport, III, *Boom Towns and Human Services* (Laramie, Wyo.: Univ. of Wyoming, 1979).

³⁷Personal communication, Dr. James Thompson to OTA, Oct. 16, 1979. See also Stan L. Albrecht, "Socio-Cultural Factors," in Mohan K. Wali (ed.), *Mining Ecology*.

"Department of Energy, Report to the President—Energy Impact Assistance (Washington, D. C.: DOE/IR-0009, UC-13; March 1978).

³⁹Supra No. 19. Under Public Law 95-238, DOE has awarded grants to Colorado and Utah for socioeconomic planning. Also, grants have been given to Rio Blanco and Garfield Counties and the Northern Ute Indian Tribe.

⁴⁰Supra No. 22.

⁴¹90 Stat. 1083 (1976), amending 30 U.S.C. sec. 201 et seq. (1976).

⁴²90 Stat. 2743 (1976), 43 U.S.C. § 1701-1782 (1976).

⁴³Supra No. 41.

⁴⁴For a number of reasons, the loan program authorized by FLPMA has yet to be implemented.

⁴⁵92 Stat. 3323 (1978).

⁴⁶Ibid.

"Department of Energy, Regional Profile—Energy Impacted Communities—Region VIII (Denver, Colo.: TIC-10001, UC-13; 1979).

⁴⁸Federal Energy Administration, *A Report—Regional Profile—Energy Impacted Communities* (Denver, Colo.: Region VIII Socioeconomic Program Data Collection Office, July 1977) pp. 5-6.

⁴⁹For a complete discussion of alternatives, see *Economic Impact of the Oil Shale Industry in Western Colorado*, hearing before the Subcommittee on Public Lands of the Committee on Interior and Insular Affairs, U.S. Senate, 93d Cong., 2d sess., Jan. 19, 1974; *Inland Energy Development Impact Assistance Act of 1977* (S. 1493), hearings

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⁵⁰C.R.S. 1973, 29-1-301 and 302.

⁵¹For an introduction to the boomtown literature, see Charles F. and Jane Archer Cortese, "The Social Effects of Energy Boomtowns in the West: A Partially Annotated Bibliography," Council of Planning Librarians Exchange Bibliography No. 1557 (Monticello, Ill.) June 1978; and P. B. Allison, "A Bibliography of Bibliographies Connecting Energy and the Social Sciences," *Social Science Energy Review*, vol. 1, No. 2 (New Haven, Conn.: Yale University Institution for Social and Policy Studies), spring 1978, 61-70.

⁵²John S. Gilmore and Mary K. Duff, *Boom Town Growth Management: A Case Study of Rock Springs—Green River, Wyoming* (Boulder, Colo.: Westview Press, 1975).

⁵³*Ibid.*, passim.

⁵⁴Adapted from Ross M. Bolt, Dan Luna, and Lynda A. Watkins, "Boom Town Financing Study," in *Financial Impacts of Energy Development in Colorado—Analysis and Recommendations* (Denver, Colo.: DLA, 1977), pp. 11-12.

⁵⁵Study of these changes necessitates the combination of theory and data from several disciplines: sociology, psychology, anthropology, economics, and political science. Such a combination is difficult to accomplish given the differences between the disciplines. In addition, applied science of this kind is often viewed with a measure of disdain by some professionals within each field.

⁵⁶"The Social Impacts of Energy Development in the West: A Symposium," *The Social Science Journal*, vol. 16, No. 2, April 1979.

"Charles F. Cortese and Bernie Jones, "The Sociological Analysis of Boom Towns," *Western Sociological Review*, vol. 8, No. 1, 1977, pp. 76-90.

⁵⁸Ronald L. Little, "Some Social Consequences of Boom Towns," *North Dakota Law Review*, vol. 53, No. 3, 1977, pp. 401-425.

⁵⁹William R. Freudenburg, *People in the Impact Zone: The Human and Social Consequences of Energy Boomtown Growth in Four Western Colorado Communities* (unpubl. doctoral dissertation, Yale Univ., 1979).

⁶⁰CWACOG, *Oil Shale Trust Fund Request* (Rifle, Colo.: Nov. 1978), p. 6.

⁶¹The complete list of developments includes:

C-a Rio Blanco Oil Shale project (Gulf and Standard)

C-b Cathedral Bluffs Shale Oil Co. (Occidental and Tenneco)

Paraho (oil shale)

Snowmass/Anschutz (coal)

Mid-Continent Garfield I/Mid-Cont. Mesa II (coal)

Superior (oil shale and minerals)

Colowyo (coal)

Utah International (coal)

Colorado Ute (powerplant)

Empire (coal)

Moon Lake (coal)

GEX CMC (coal)

Sheridan (coal)

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Union Oil (oil shale)

Storm King (coal)

Colony/Atlantic Richfield and Tosco (oil shale)

Northern Minerals (coal)

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⁶³Personal communication, Dan Deppe (city manager) to Dr. Donald Scrimgeour and Miss Ellen Hutt, July 1979.

⁶⁴Donald P. Scrimgeour and Marilyn Cross, *Development Patterns and Social Impacts: A Focus on the Oil Shale Region* (Denver, Colo.: Quality Development Associates, July 1979).

⁶⁵Discussion with Mr. Floyd McDaniel, Chairman, Planning Commission, Grand Valley, August 1979.

⁶⁶Personal communication, Peter Kernkamp (town planner) to Dr. Donald Scrimgeour and Miss Ellen Hutt, July 1979.

⁶⁷Personal communication, Bob Young (town manager) to Dr. Donald Scrimgeour and Miss Ellen Hutt, July 1979.

⁶⁸Department of the Interior, *Draft Environmental Statement: Proposed Superior Oil Company Land Exchange and Oil Shale Resource Development* (Denver, Colo.: BLM, August 1979) pp. 77-90.

⁶⁹Supra No. 50.

⁷⁰Supra No. 67.

⁷¹Supra No. 64.

⁷²Supra No. 67.

⁷³Personal communication, Mr. William Brennan to OTA, January 1980.

⁷⁴Ibid,

⁷⁵Supra No. 68.

⁷⁶Supra Nos. 47 and 48.

⁷⁷83 Stat. 852 (1970), as amended by 89 Stat. 424 (1975), 42 U.S.C. 4321-4347.

⁷⁸Ibid.

⁷⁹See, for example, *Calvert Cliffs Coordinating Committee, Inc. v. U.S. Atomic Energy Commission*, 449 F.2d 1109 (D.C. Cir. 1971), cert. denied, 404 U.S. 942.

⁸⁰90 Stat. 1013 (1976), 16 U.S.C. 1451-1464.

⁸¹86 Stat. 1280 (1972), 16 U.S.C. 1451-1464.

⁸²Supra No. 38.

⁸³Ibid., pp. 59-81.

⁸⁴*Rocky Mountain Energy Resource Development: Status, Potential, and Socioeconomic Issues* (Washington, D. C.: GAO, July 1977), EMD-77-23.

⁸⁵Ibid., pp. 5-7.

⁸⁶Supra No. 45.

⁸⁷*Energy Impact Assistance: A Background Report*, printed at the request of the Committee on Energy and Natural Resources, U.S. Senate, 96th Cong., 1st sess., October 1979 (publ. No. 96-34) (committee print).

⁸⁸For a spirited elucidation of this position, see Raymond L. Gold, "On Local Control of Western Energy Development," *The Social Science Journal*, vol. 16, No. 2, April 1979, pp. 121-127.

⁸⁹Supra No. 45.