

CHAPTER 12

Revenues and Socioeconomic Impacts

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Revenues and Socioeconomic Impacts

Introduction

This chapter responds to the third of OTA's tasks under Public Law 94-377: calculation of potential Federal revenues from existing leases. It provides an estimate of revenues from rentals and royalties based on OTA's analysis of lease development and production prospects. The chapter also describes the various methods used by the Western coal States to distribute their share of mineral leasing revenues and discusses Federal and State programs for ameliorating the adverse impacts of energy development. Areas that potentially will be affected by expanded Federal coal development are identified.

Background

Rapid growth and its consequent social disruption have been characteristic of much energy development in the Northern Great Plains and Rocky Mountain regions. Large influxes of people, associated with the construction and operation of energy projects, have come to rural towns. Prior to this, many of the communities had stable or declining populations and economies based on service to agriculture.

With the sudden increases in population, local social structures have been hard pressed to meet the needs of the residents. Both public and private sectors have faced difficulties. Among the consequences of rapid growth have been:

- acute housing shortages with rapid cost escalations;

- inability of the public sector to provide services, such as sewer and water, in a timely way;
- dislocations in the private sector, such as business failures and labor shortages;
- manifestations of increased social stress, such as crime, truancy, and suicide;
- accompanying pressure on health, welfare, public safety, and mental health services;
- discontent expressed by both old and new residents; and
- high turnover rates and declines in productivity among employees of energy industries.

Financial shortfalls during the early stages of rapid growth have been particularly acute. These are called front-end financing difficulties. New public works, such as water or sewer systems, cannot be built quickly and they are expensive. In some instances, local voters have been reluctant to approve bond issues for public works, fearing that after the boom they will be left with a large debt. In other cases, towns have been limited by State statutes in the amount of debt they can incur.

As a result, most Great Plains and Western States have devised mechanisms to assist local governments in meeting both their front-end financing requirements and the other needs arising from rapid growth. Federal mineral leasing revenue payments are an important source of funds for impact assistance. A variety of types of other Federal aid also are available.

Potential Federal Coal Leasing Revenues

Under section 35 of the Mineral Leasing Act of 1920, each State receives a share of the revenues derived from sales, bonuses, rentals and royalties from mineral activities on public lands within its borders.¹ Originally, a State's share was 37.5 percent; it was to be spent by the State legislature "for the construction and maintenance of public roads or for the support of public schools or other public educational institutions."² Of the remaining revenues, 52.5 percent went to the Reclamation Fund to be used for water projects, and 10 percent went to the U.S. Treasury. { From 1920 to June 30, 1976, over \$1.3 billion was distributed to the Western States for public roads and schools. There was no requirement that the areas most affected by mineral development on Federal lands receive priority in the allocation of the States' share.

In 1976, section 35 was amended to increase a State's portion of the revenues from

¹30 U.S.C. 191.

²Act of Feb. 25, 1920, c. 85, sec. 35, 41 Stat. 450.

³As part of its statehood entitlement, Alaska receives 90 percent of the Federal mineral leasing revenues generated within the State since it does not participate in the Reclamation Fund. See 30 U.S.C. 191. The Reclamation Fund was established by the Act of June 17, 1902, c. 1093, 32 Stat. 388, now codified at 43 U.S.C. 391, as amended. Moneys in the Fund are to be used for the reclamation of arid and semiarid lands through construction of dams, reservoirs, and irrigation projects, and for other specified purposes for the benefit of 17 Western States.

37.5 to 50 percent. The amount paid into the Reclamation Fund was reduced to 40 percent. In addition, purposes for which the State distributions could be spent were broadened.⁴ Each State legislature can now allocate mineral leasing revenues "giving priority to those subdivisions of the State socially or economically impacted by the development of minerals leased under this chapter for 1) planning, 2) construction and maintenance of public facilities, and 3) provision of public service."⁵ This language established for the first time a specific priority for use of the revenues for impact assistance,

According to the Congressional Budget Office (CBO), a total of \$210 million in Federal mineral royalty payments were distributed to the States in fiscal year 1979.⁶ Most of these payments came from oil and gas leases; only \$14 million (about 7 percent) came from coal leases on Federal lands in the West, according to CBO. Table 94 shows the total Federal coal production and total coal royalties reported by the Department of the Interior

⁴The major amendments to sec. 35 (raising the State's share and broadening the purposes) were made by sec. 9 of the Federal Coal Leasing Amendments Act of 1976. Public Law 94-377, 90 Stat. 1087 (1976).

⁵30 U.S.C. 191.

⁶Energy Development, Local Growth, and the Federal Role, Congressional Budget Office, U.S. Congress, June 1980, p. 24.

**Table 94.—Federal Coal Production and Royalty Revenues, by State:
Fiscal Years 1979 and 1980**

State	FY 1979	FY 1979	FY 1980	FY 1980
	coal production (tons)	royalty revenues (\$)	coal production (tons)	royalty revenues (\$)
Alabama	1,777	1,916	27,780	31,669
Colorado	7,401,530	3,852,839	8,562,862	7,115,564
Kentucky	59,637	62,385	9,219	10,830
Montana	7,964,316	1,298,325	10,345,255	2,065,885
New Mexico	4,660,225	1,048,550	6,546,224	1,472,900
North Dakota	589,079	134,622	1,418,129	272,272
Oklahoma	333,773	789,681	299,599	826,942
Utah	6,778,615	1,476,612	8,616,415	3,968,073
Washington	215,662	43,124	0	0
Wyoming	31,136,664	7,411,170	36,130,862	8,804,557
Total	59,141,237	16,119,225	71,958,165	24,568,692

SOURCE: U.S. Department of the Interior, *Federal Coal Management Report* Fiscal Year 1980, 1981.

(DOI) for fiscal years 1979 and 1980; the States received one-half of these receipts,

Royalties are expected to increase substantially in the next decade, although the magnitude of the increase depends on the assumptions of the forecaster. CBO estimates that total payments from all types of mineral leases will reach \$450 million to \$500 million by fiscal year 1985. State shares of revenue from coal, CBO projects, will grow from \$14.1 million in fiscal year 1979 to \$65 million to \$85 million by fiscal year 1985.

Budget figures prepared by DOI for fiscal year 1982 show an expected increase in total coal royalties from existing and new leases in all States from \$24,6 million in fiscal year 1980 to \$131 million in fiscal 1985, and to \$792 million in fiscal 1990 (again the States would get half these revenues).⁷ OTA's estimates of potential revenues from coal production on existing Federal leases also show a significant rise in payments (see below).

The increases can be attributed to several factors: the anticipated expansion of Federal coal production, the scheduled readjustments of existing leases to, and the issuance of new leases at the higher minimum royalty rate of 12.5 percent for surface mines required under the Federal Coal Leasing Amendments Act of 1976 (FCLAA).

OTA Estimates of Potential Revenues From Federal Coal Leases

Section 10 of FCLAA directed OTA to provide an estimate of the "receipts to the Federal Government" from existing Federal leases. OTA calculated the potential rentals and royalties for 1986 and 1991 based on OTA's estimates of the production prospects for Federal leases presented in chapter 6 of this report. The estimates include increased royalty rates on all leases that are due for readjustment over the next decade.

⁷Personal communication, U.S. Geological Survey, Conservation Division, Royalty Accounting Section, February 1981.

According to OTA's analysis, total Federal royalty revenues from existing leases in the six Western coal States should increase from \$31.5 million in 1980 to \$193 million to \$215 million in 1986, and to as much as \$336 million to \$544 million in 1991 (depending on the rate of development of existing leases). The States will receive half these revenues. In the past, the amounts received as the States' shares of bonuses and rentals have been small compared to the front-end costs of meeting the impacts of coal development. Only when royalty payments started with commercial production have the States received significant benefits from coal lease revenues.

Bonuses

When Federal coal leases are offered competitively, the successful bidder pays a lump sum or "bonus" for acquisition of the lease as well as an annual rental and percentage royalty on production. Under the current bidding system, DOI establishes the rental and royalty before the lease sale and the lease is awarded to whoever offers the highest bonus bid. FCLAA requires that half of the leases for sale in any year be offered on a system of deferred bonus bidding, which allows lessees to pay the bonus in installments. No bid can be accepted for less than the fair market value of the coal, which is established before the sale by the U.S. Geological Survey (USGS).

No bonus is paid for the acquisition of a noncompetitive preference right lease. About half of the existing leases were issued through the preference right system and the more than 170 pending preference right lease applications (PRLAs) could result in new additional noncompetitive leases. When new leases are offered, the States receive half of the bonuses paid.

Table 95 shows the bonus payments received for Federal coal leases between 1954 and 1980. Since 1954 over \$15 million has been received in bonuses for competitive leases. Of this amount, \$1.4 million was paid after the 1976 amendments raising the State

Table 95.—Competitive Coal Lease Sales on Public Lands Fiscal Years 1954-1980 (acreage, bonus payments, average bonus per acre)

Fiscal year	Total acres	Total bonus payments	Average bonus dollar per acre
1954	400	\$ 420	\$ 1.05
1955	0	0	
1956	4,316	4,317	1.00
1957	3,863	6,064	1.57
1958	15,375	19,176	1.25
1959	8,805	224,179	25.46
1960	4,358	9,055	2.08
1961	12,733	20,531	1.61
1962	38,976	202,404	5.19
1963	20,780	143,023	6.88
1964	10,768	39,532	3.66
1965	23,264	146,258	6.15
1966	44,894	753,727	16.79
1967	43,885	721,294	16.44
1968	88,037	3,077,736	34.96
1969	0	0	0
1970	18,493	370,395	20.03
1971	28,386	7,618,634	268.39
1972	0	0	0
1973	0	0	0
1974	3,989	390,776	97.96
1975	0	0	0
1976	0	0	0
1977	0	0	0
1978	574	31,380	54.69
1979	6,395	803,408	125.62
1980	7,817	582,369	74.50
Total	385,408	\$15,164,678	\$ 39.35

SOURCE: U.S. Department of the Interior, U.S. Geological Survey, Conservation Division, Federal and Indian Lands Coal, Phosphate, Potash, Sodium, and Other Mineral Production, Royalty Income and Related Statistics. CY 1980.

share to 50 percent. Throughout the period, individual bonus payments ranged from as low as \$0.25/acre to hundreds of dollars per acre depending on when the sale was held and on the location and quality of the reserves.

Rentals

Estimated rentals from Federal leases are shown in table 96. The rentals are small com-

pared to the revenues received from royalties. However, for States with large amounts of Federal lands under lease but with small amounts of production, rentals can be a significant component of their Federal revenue. Before passage of FCLAA, the amount of annual rental paid was subtracted from the royalties due. New leases and leases readjusted after August 4, 1976 do not allow rentals to be subtracted from royalties and require payment of annual rentals as well as production royalties. The amount of rental charged is set by the Secretary of the Interior before the lease sale and at readjustment. Most pre-FCLAA leases have rentals of \$1.00/acre; minimum rentals for post-FCLAA and pre-FCLAA leases at readjustment are currently set at \$3.00/acre, although some leases have rentals as high as \$7.00/acre.

Royalties

Federal coal royalties are based on either a straight fee per ton, generally between \$0.15 and \$0.22/ton for many pre-FCLAA leases, or a percentage royalty of the sale price per ton of coal produced with a statutory minimum of 12.5 percent for surface mined coal. The 1979 annual Federal coal management report noted the following about the percentage ad valorem royalty provision:

The amount of money collected under a cents-per-ton royalty does not increase as the value of the coal production increases. During the 1970's, the Department shifted to percentage ad valorem royalties which provide that royalty payments to the Government will increase as the value of the coal increases. Conversely, the Government will share the risk with the lessee, receiving in ab-

Table 96.—Estimated Rental Payments for Federal Leases in 1986 and 1991

State	Number of leases	Total acres	1986 ^a total rentals	1991a total rentals
Colorado	127	124,091	\$253,886	\$373,748
Montana	21	37,327	73,992	111,858
New Mexico	29	44,760	119,772	133,596
North Dakota	20	18,048	46,684	57,556
Utah	204	279,416	650,721	855,186
Wyoming	101	217,067	548,072	660,734
Total	502	720,709	\$1,693,129	\$2,192,678

^a Rentals not reduced for portion of rentals credited to royalties due for unadjusted leases

SOURCE: Office of Technology Assessment

solute terms, less royalty money should the future price of coal decrease.

In calculating the potential royalty payments, OTA used the production estimates derived from the OTA analysis of the development prospects of Federal leases (ch. 6). These production estimates are expressed in ranges of production that reflect uncertainties based on markets, transportation availability, and the rate of mine construction. Consequently, royalty estimates reflect similar uncertainties. Because detailed long-term contract information and individual mine cost data were not available, OTA used a regional competitive mine-mouth price of coal in calculating future royalty payments. The actual mine-mouth sales price may be higher or lower than the regional figures used. The competitive mine-mouth prices were derived from an economic analysis done for OTA and are based on projections of the potential demand for Western coal. For the Hanna basin and Denver-Raton Mesa coal fields, which were not included in the economic analysis, OTA substituted an estimated mine-mouth price based on a review of DOE's national coal model supply curves and on OTA contractor surveys of mine operators. Table 97 shows the competitive mine-mouth prices used in the royalty calculations.

The estimates for all leases that are due for readjustment before 1991 reflect higher rental and royalty rates—\$3.00/acre rental and 12.5 percent surface and 8.0 percent underground royalties, Pre-FCLAA lease rentals were generally set at \$1.00/acre and royalties at \$0.15/ton. The increases in royalty payments from readjustments will be substantial. For example, for underground coal mined at \$20.00/ton, the current royalty may be as low as \$0.15/ton; on readjustment, it would be raised to 8 percent of \$1.60/ton—more than 10 times the previous level. For surface mined coal, the increase will also be substantial. Total Federal coal royalty payments in calendar year 1980 were about \$32 million on total production of 69 million tons. Table 98 shows the potential Federal coal production, total royalty revenues, and State distributions estimated for 1986 and 1991.

Some existing underground mines have requested royalty reductions from the current minimum of 8 to 5 percent or lower under the provisions of section 39 of the Mineral Leasing Act and current regulations. ³⁰There is no statutory minimum royalty for underground

³⁰ U.S.C. 207

Table 97.—1986 and 1991 Competitive Mine-Mouth Prices by Federal Coal Production Regions (1979 dollars per ton)

Region	Btu/lb	1986 dollars/ton	1991 dollars/ton
Fort Union	6,000	6.00 Surface	6.00 Surface
Powder River basin	8,500	7.40 Surface	7.40 Surface
Hanna basin	10,500	16.50 Surface	16.50 Surface
Green River-Hams Fork:			
Wyoming	10,000	14.50 Surface 25.30 Underground	18.60 Surface 25.30 Underground
Colorado	10,000	20.00 Surface and underground	23.90 Surface and underground
Uinta	12,500	24.00 Underground	24.20 Underground
Southwestern Utah	11,000	11.80 Surface 24.00 Underground	11.80 Surface 24.20 Underground
San Juan	10,000	15.10 Surface and underground	15.30 Surface and underground

NOTE All prices are for steam coal
SOURCE Office of Technology Assessment

Table 98.—Federal Royalties and State Distributions From Potential Coal Production on Federal Leases 1980 (actual) and 1986, 1991 (estimated) (1986 and 1991 royalties are in constant 1979.1980 dollars)

State	1980 ^a			1986 ^b			1991 ^b		
	Federal lease production (millions of tons)	Royalty total (millions of dollars)	State share of	Federal lease production (millions of tons)	Royalty total (millions of dollars)	State share of	Federal lease production (millions of tons)	Royalty total (millions of dollars)	State share of
Colorado	9.4	8.9	4.5	27	49	24	33-40	78-94	39-47
Montana	10.4	2.7	1.3	23-31	21-27	10-14	25-40	23-37	12-19
New Mexico	6.3	7	3.5	9-11	15-16	7-8	12-16 ^c	21-28 ^c	11-14 ^c
North Dakota	0.6	(0.3)	0	about 6	about 4	2	6	5	2
Utah	8.7	4.5	2.5	26	48	24	34-66	64-122	32-66
Wyoming	33.4	8.7	4.4	113-150	57-71	28-36	133-238	145-258	73-129
Total (West)	68.8	31.5	16.2	204-250	193-215	95-108	245-405	336-544	168-277

Details may not add to totals because of independent rounding.

a U.S. Department of the Interior, U.S. Geological Survey, Conservation Division, *Federal and Indian Lands, Coal, Phosphate, Potash, Sodium, and Other Mineral Production, Royalty Income, and Related Statistics, Calendar Year 1980*, June 1981.

b Royalty estimates assume timely readjustment of leases to a minimum royalty of 12.5 percent for surface coal and 8 percent for underground coal.

c Excludes about 8 million tons of Federal PRLA production and about \$15 million in PRLA royalties.

mines as there is for surface mines. In some areas where underground mining costs are high, the royalty paid for underground mined coal can be higher per ton than that charged for surface mined coal. It is possible that, if many underground operations receive underground royalty rate reductions, total royalty

revenues could be lowered in States such as Colorado and Utah where underground production is significant. But in return, since the royalty reduction is intended to allow the mine to be operated at a profit, it assures continued production, employment, and other revenues.

State Allocation of Federal Mineral Leasing Revenues

In response to the 1976 amendments and to local priorities for impact assistance, each Western State has established its own formula for spending Federal revenues. As the income from Federal production grows and local needs change, the States can alter these disbursement formulas. Current State practices (surveyed by OTA in 1980) are described in the following section.

Colorado

Colorado distributes its Federal mineral revenues in four different ways (table 99). The Mineral Impact Fund is dispensed by the Executive Director of the Department of Local Affairs, after a recommendation procedure involving local, regional and State entities. (State severance tax receipts are handled in the same way.) The Fund is used for planning, construction and maintenance of public facilities and for the provision of

Table 99.—Colorado Allocation of Federal Coal Royalties

State public school fund	25%
Water Conservation Board	10%
Mineral Impact Fund	15%
Counties (limited to \$2(X),000 per county per annum; any excess to school fund)	50%
Total	100%

SOURCE: Colo. Rev. Stat. 1973, 3463-101, 102, as amended.

public services. Priority is given to “political subdivisions socially or economically impacted by the development, processing, or energy conversion of minerals” from lands leased from the Federal Government or subject to State severance taxes.⁹

A limitation of \$200,000 per year on the direct county allotment means that major energy-producing counties receive much less

⁹ Colo. Rev. Stat. 1973, §§34-63-102 and 39-29-110 (1979 Supp.).

than 50 percent of the revenues. The excess goes into the public school fund, In fiscal year 1980, for example, Rio Blanco County generated \$5.86 million and Moffat County \$1.07 million of the \$20.3 million that came back to the State. The \$200,000 that each received amounted to 3.4 and 18.6 percent of the respective royalty revenues they generated. Six Colorado counties reached the \$200,000 limitation; the spillover was \$7.7 million (38 percent of the amount the State received), which raised the school revenues to \$12.7 million (63 percent of the total receipts).

The original \$200,000 per county limitation was enacted at a time when total mineral lease revenues were low and some Colorado counties were receiving far greater oil and gas revenues than their sparse populations could justify. These conditions have changed dramatically with substantial growth from coal development and expected change from proposed oil shale processing; as a result, legislation to raise the maximum has recently been proposed.

Wyoming

In Wyoming, revenues from the Federal mineral royalties are assigned according to a complex formula (table 100). About 19% percent is available for local assistance, including 21A percent for roads, 71/2 percent for public facilities, and 9¾ percent for communities.

The Wyoming Farm Loan Board allocates grants from the Impact Assistance Account and has the authority under the Joint Powers Act¹⁰ to issue \$60 million in loans to energy impacted jurisdictions. (See discussion on severance taxes, below, for a description of additional Wyoming mitigation programs.)

Utah

In Utah, 32% percent of the mineral leasing revenues are dedicated to a Community Impact Account (table 101). Established in 1977, it is a revolving fund for loans and

Table 100.—Wyoming Allocation of Federal Mineral Lease Revenues

State Highway Fund for construction and maintenance of permanent roads and highways in impacted counties	2.25%
Public School Foundation Fund	37.50
State Highway Fund	26.25
University of Wyoming (pledged to bond issues).	6.75
Incorporated cities and towns for planning, construction or maintenance of public facilities or providing public services (\$10,000 plus formula).	7.50
Wyoming Government Royalty Impact Assistance Account (Farm Loan Board)	9.75
(a) For impacted incorporated cities and towns, counties, joint powers boards without existing revenue sources; and	
(b) To fund planning, construction and maintenance of public facilities, provisions of public services or equipment purchases.	
School District Capital Construction Account	10
	100%

SOURCE: Office of Technology Assessment

Table 101.—Utah Allocation of Federal Mineral Lease Revenues

Community impact account revolving fund	32.5%
Board of Regents-institutions of higher learning	33.5%
State Board of Education.	2.25%
Geological and Mineralogical survey	2.25%
State Water Research Laboratory	2.25%
General fund appropriation	27.25%
Total	100% ⁰

SOURCE: Utah Code Ann. 1953, 63.51-1 through 4

grants to political subdivisions that are socially or economically impacted by mineral resource development.¹¹The account is particularly important since Utah is the only Western coal-producing State without a coal severance tax. For the 1978-79 period, Utah received \$13 million in mineral leasing moneys of which \$4.2 million was allocated to the Community Impact Account. However, impacted communities requested more than \$11 million. Most of the funds have been used for water and sewer projects in communities with critical growth problems.

The State requires that a majority of the funds given to the Board of Regents for higher education be spent for research, educational,

¹⁰ Wyo. Stat. §§9-1-1 29 through 136.

¹¹ Utah Code Ann. 1953, §§53-7-1 and 2: 65-1-64 and 65; and 65-1-1 15(1979 Supp.).

and service programs to benefit communities economically or socially affected by mineral leasing activities.

Other Western States

The other Western States distribute funds by a variety of formulas. Montana currently provides 62.5 percent of its Federal royalties for schools and 37.5 percent for highway im-

provements. How much of this money ends up in energy impacted communities is difficult to determine. New Mexico designates virtually all of its Federal mineral revenues to the General Permanent Fund for the public school textbook fund and other purposes. North Dakota similarly places all its royalties in the general fund for distribution to public schools.

Federal Programs To Assist Energy-Impacted Communities

Loans Against Future Leasing Revenues

Section 317(c) of the Federal Land Policy and Management Act of 1976¹² authorizes the Secretary of the Interior to make loans to States against their share of anticipated mineral leasing receipts for any prospective 10-year period. The loans, intended to address front-end financing problems, are to be made specifically for relieving the socio-economic impacts associated with Federal mineral development activities. The program has yet to be extensively used by the States. ”

Payment in Lieu of Taxes (PILT)

The Payment in Lieu of Taxes Act of 1976¹⁴ provides Federal funds to local units of government as compensation for taxes that they cannot levy on the tax exempt Federal lands within their boundaries. With regard to coal development, annual payments are made to local jurisdictions that contain land administered by the Bureau of Land Management (BLM) or the U.S. Forest Service. The

¹²Public Law 94-579; 90 Stat. 2743; 43 U.S.C. 1747.

¹⁴According to the CBO study, note 6 *supra*, the loan Program met with initial objections from the executive branch because of the low interest rates provided. In 1978, the act was amended to allow higher rates, thus removing the major objection. A total loan level of \$212 million was authorized through fiscal year 1982, although no funds have been appropriated, and \$40 million of the authorization expired in fiscal year 1979. See Public Law 95-352, sec. 1(c), 92 Stat. 515, Aug. 20, 1978.

¹⁵Public Law 94-565.

PILT funds are allocated under a formula based on acreage, population, and revenue producing programs on public lands such as timber, grazing and mineral development. Although not so designated, the funds are often used for energy impact assistance. 's Total (coal and other) payments under PILT in 1979 were \$105 million and in 1980 amounted to approximately \$108 million (table 102).

An important feature of PILT is that the payments given to local governments are reduced by the amount of Federal mineral lease revenues redistributed to these jurisdictions by the States. That is, any lease revenues that flow directly to local areas are deducted from the per-acre PILT payments. This arrangement serves as an incentive for States to use mineral royalties for purposes other than returning them directly to impacted jurisdictions. But it makes no difference to the local

¹⁵PILT payments are made almost exclusively to county governments, since cities and towns generally do not contain BLM or Forest Service lands.

Table 102.—Payments in Lieu of Taxes by State

State	FY1980 payment
Colorado	\$7,507,361
Montana	8,078,067
New Mexico	9,589,751
North Dakota	571,552
Utah	8,146,654
Wyoming	6,550,736

SOURCE: Department of the Interior.

governments, since they receive equal sums, either from Federal PILT payments or from the State's share of mineral lease receipts.

Abandoned Mine Reclamation Funds

The Surface Mining Control and Reclamation Act of 1977¹⁶ provides for annual grants to States to help develop, administer, and enforce statewide reclamation programs. The programs are for Federal and non-Federal lands disturbed by coal mining. The act also establishes Federal and State abandoned mine reclamation funds, financed primarily by revenue derived from a reclamation fee of \$0.35/ton of surface-mined coal and \$0.15/ton of underground-mined coal, or 10 percent of the gross value of the coal, whichever is less.

Fifty percent of the reclamation fees collected annually in any State must be allocated to the State's abandoned mine reclamation fund. This in turn must be used to reclaim any land mined for coal and abandoned (or otherwise left in an inadequate reclamation status) prior to 1977. If all such land in a State has been reclaimed, the State may use its 50 percent of the fees for construction of public facilities in communities impacted by coal development.¹⁷ The State must certify, and the Secretary of the Interior agree, that there is a need for such facilities and that the moneys available under the Mineral Leasing Act or the PILT payments are inadequate for such construction.

Since the Western States until recently have had little large-scale coal mining, they have fewer abandoned, unreclaimed coal mines than the Eastern States. Therefore they are more likely to qualify to use their 50 percent for public facilities in coal impacted communities. This could be a major source of funds for Western States with approved reclamation programs.

¹⁶Public Law 95-87, 91 Stat. 445, 30 U.S.C. 1201 et seq. Title 4 of the act established the Reclamation Fund.

¹⁷30 U.S.C. 1233(g)(1).

"601" Program

A Federal program for energy impacted areas was established by section 601 of the Powerplant and Industrial Fuel Use Act of 1978.¹⁸ Administered by the Farmer's Home Administration in the Department of Agriculture, it provides funds for planning assistance and acquisition of land for housing and public facilities in communities affected by coal or uranium development. Individual States have not received much assistance from section 601 programs because of the relatively small appropriation (\$20 million in 1979 and \$50 million in 1980), the statutory limitations on the use of the money, and the large number of States that have applied for assistance.

Other Federal Programs

BLM is supporting a project on the social effects of the Federal coal management program in the West.¹⁹ The project will develop a guide for social impact assessment to help fill existing data gaps and remove some theoretical uncertainties about community disruption. Because it is designed to improve the generic process, the project should, in the long run, significantly improve the social and economic mitigation aspects of Federal leasing efforts.

A variety of other programs, not directed at energy or mineral development, is also available to State and local governments; however, only a few deal with socioeconomic problems. According to various authors, from 30 to 165 programs have been useful to boomtown communities.²⁰

¹⁸Public Law 95-620; 92 Stat. 3323 (1978).

¹⁹BLM Social Effects Project, Mountain West Research, Inc., Billings, Mont.

²⁰The following reports provide information useful to impacted communities:

An Assessment of Oil Shale Technologies (ch. 10), OTA, GPO stock No. 052-00340759-2 (Washington, D. C.: Government Printing Office, 1980).

Energy Development in the Western United States—Impact on Rural Areas, Murdock and Leistriz (New York: Praeger Publishing, 1979).

Report to the President-Energy Impact Assistance, Energy Impact Assistance Steering Group (Washington, D. C.:

State Programs

Each State has developed ways of providing technical and financial assistance to energy impacted areas. In addition to traditional revenue sources such as sales, income, and excise taxes used to support general programs, Western States have relied on three specific sources for energy impact mitigation. These are Federal mineral royalties, State severance taxes, and bonding authority. In most States, severance tax revenues contribute the most aid.

Severance Taxes

A severance tax maybe broadly defined as a special levy assessed at flat or graduated rates on the extraction of natural resources. Severance taxes are distinguished from other taxes by their imposition on the removal of the natural resource rather than on the resource itself. Legally, severance taxes are generally held to be excise rather than property taxes and, as such, are not subject to the constitutional requirements placed on property taxes of uniformity and equality. There has been much controversy on the nature, level, and distribution of severance taxes.

Some of the arguments cited in support of severance taxes include:

- Natural heritage.—A State's natural resources are an irreplaceable heritage of the people of the State. A severance tax is compensation for a portion of the irretrievable loss of this wealth.
- Conservation of natural resources.—If a tax is high enough, the increased price of the extracted mineral should slow the rate of resource exploitation and stimu-

late the substitution of alternative technologies and/or renewable resources.

- Internalization of socioeconomic costs.—The significant public costs associated with large-sale mineral development can be internalized by levying a severance tax. If the tax is shifted to consumers, a price for the resource can be established that reflects a truer cost of production, both public and private.
- Capture of economic rent.—According to the concept of economic rent, the finite nature of natural resources results in a market price that includes a portion representing pure surplus that can be taxed away without affecting consumer price, production levels, or allocation of resources. For example, in passing the Montana Coal Severance Tax Act, the Montana Legislature declared that "coal in Montana, when subbituminous and recoverable by strip mining, is in sufficient demand that at least one-third of the price it consumes at the mine may go to the economic rents of royalties and production taxes."
- Statewide sharing of tax benefits.—Since mineral development often occurs in less populated rural areas, more populous regions sometimes feel they deserve a larger share of the benefits from this development. In addition, areas away from the immediate energy-producing regions can be affected by energy development. For example, between 1975 and 1978, approximately 75 percent of Colorado's growth in mining employment occurred not in the outlying resource areas but in the Denver metropolitan area. A severance tax can help spread benefits throughout the State.

Continued from p. 355.

DOE/IR-0009, 1978).

Mitigating Adverse Socioeconomic Impacts of Energy Development, Denver Research Institute (Denver: DRI, 1977).

Federal Assistance for Energy Impacted Communities, Mountain Press FRC (Denver: MPFRC, 1979).

The Direct Use of Coal (ch. 6), OTA, GPO stock No, 052-003-00664-2 (Washington, D. C.: U.S. Government Printing Office, 1979).

State Income From Severance Taxes

Colorado, Montana, New Mexico, North Dakota, and Wyoming impose severance taxes. Of the coal-producing States, only Utah does not; however, Utah does impose a mining

occupation tax on various minerals (excluding coal). Figure 53 shows severance tax income from all minerals, not just coal, and the portion of total State revenues contributed by severance taxes. Wyoming ranks highest in percentage (25 percent) of State revenue derived from severance taxes. New Mexico received the largest amount (\$159 million in fiscal year 1979), although only 13 percent was from coal. A common trend is the increase over the past 5 years in funds available to the States through these taxes.

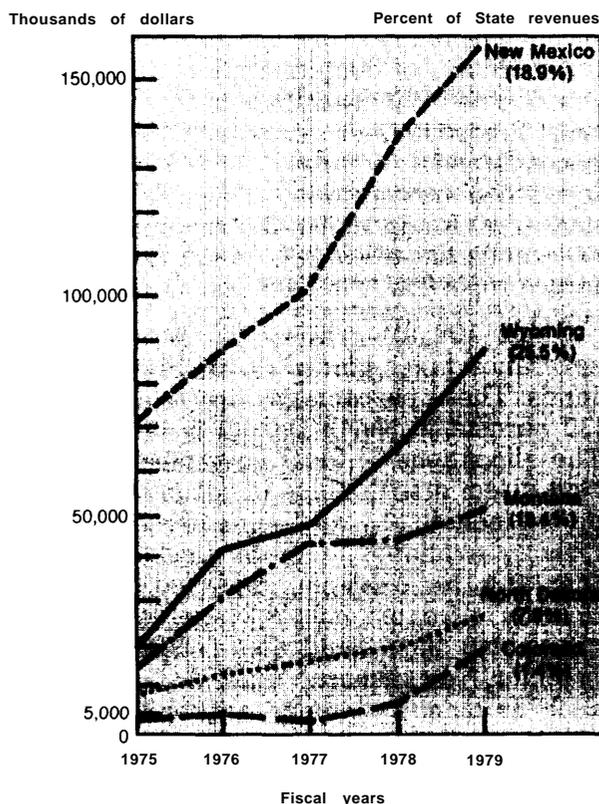
In general, coal severance taxes are calculated either as a flat rate of production or as a percentage of net or gross value of the coal produced. Table 103 shows the different bases currently used for assessing severance taxes. The 30-percent rate in Montana is the highest of the Western States and its consti-

Table 103.—Coal Severance Taxes

Colorado		
Coal—Surface	\$0.63/ton	
Underground	\$0.315/ton	
Adjusted by wholesale price index.		
Montana		
Heating quality (Btu/pound)	Surface mining	Underground mining
Under 7,000	\$0.12 or 20% of value	\$0.05 or 3% of value
7,000-8,000	\$0.22 or 30% of value	\$0.08 or 4% of value
8,000-9,000	\$0.34 or 30% of value	\$0.10 or 4% of value
over 9,000	\$0.40 or 30% of value	\$0.12 or 4% of value
Resource indemnity trust tax (all minerals): \$25.00 plus 0.5 percent of gross value of product if in excess of \$5,000.		
New Mexico		
Coal—Steam coal	\$0.57/ton	
Adjusted by consumer price index escalator (in 1981 total tax is \$0.73 per ton)		
North Dakota		
Coal—Steam coal	\$0.50/ton	
Adjusted quarterly based on wholesale price index.		
Wyoming		
Coal	10.50/0 of gross value	

SOURCE: CERI, *Mineral Severance Taxes in Western States; A Comparison*, pp. 5-15 and Office of Technology Assessment survey of State Revenue Agencies, January 1981

Figure 53.—Total Severance Tax Revenues (all minerals)



SOURCE: Office of Technology Assessment.

tutionality has been challenged by mining companies and coal consumers. On July 2, 1981, the U.S. Supreme Court ruled that Montana could impose a severance tax this high without violating either the Commerce Clause or the Supremacy Clause of the United States Constitution.²¹

Allocation of Severance Taxes Revenues

Table 104 summarizes the distribution of coal severance tax revenues. New Mexico does not follow a specific allocation formula; instead, all its revenues are placed in the Severance Tax Bonding Fund. Each year the legislature authorizes the issuance of bonds for a variety of projects, including impact assistance. Any portion of the fund that is not pledged to the principal and interest on outstanding bonds is deposited in the Severance Tax Permanent Fund. The Community Assistance Authority makes recommendations for the issuance of bonds for projects in areas affected by mineral and energy develop-

²¹Commonwealth Edison Co. v. Montana, No. 80-581, July 2, 1981 (slip opinion).

Table 104.—Allocation of Coal Severance Tax Revenues

Category	Colorado	Montana	New Mexico ^a	North Dakota	Utah ^b	Wyoming
General fund	0% (1981 and after) (20% 1980)	19.00%		30%		19.0%
Permanent trust fund	50% (1981 and after) (35% 1980)	50.00%		15%		23.9%
Local government	50% ^c	8.75%	10%	35% ^d		19.0% ^e
Other		22.25% ^f		20% ^g		38.1% ^h

^aReallocated annually by legislature

^bUtah has no severance tax

^c15 percent of local government severance tax fund is automatically distributed to affected jurisdiction in proportion to the number of mine employees who reside in the county's unincorporated areas. Remaining 85 percent is distributed at discretion of Executive Director of Department of Local Affairs, with advice from an energy impact assistant advisory committee.

^dThe Coal Development Impact Fund is administered by Coal Development Impact Office that makes discretionary grants to impacted communities

^eThe Coal Impact Fund, administered by the Farm Loan Board consisting of key State officials, makes grants to local governments in special districts affected by coal production for financing water, sewer, highway, road and street projects.

^fThis category includes 5 percent for school equalization, 10 percent education trust, 0.5 percent county planning, 2.5 percent alternative energy research, 1.25 percent renewable resource development, 25 percent parks, historical and cultural sites and 0.5 percent library commission.

^gDistributed to counties on the basis of the proportion of the total State coal production in that County

^hThis is comprised of 14.3 percent in water development fund, 95 percent in highway fund, and 14.3 percent in capital facilities fund which is used for State government facilities, school buildings, and community colleges.

ment, and \$10 million is allocated annually for the specific purpose of making grants to impacted communities.

Colorado gives energy developers a credit against their severance taxes for certain approved contributions made to local communities to assist with preventive efforts before a project begins operation.

Colorado, Montana, North Dakota, and Wyoming place a percentage of their coal severance tax revenues in trust funds. These funds are intended to compensate future generations for depletion of nonrenewable resources. The purposes of the funds are stated in general terms; the most common areas for investment are the reestablishment and diversification of the economic base in anticipation of the day when the mines are exhausted. The funds also can be used to redress any long-term environmental consequences of prolonged coal mining. They are in part a response to the boom and bust cycles that have historically characterized mineral development in the West.

Four of the seven Western coal-producing States—Wyoming, Montana, New Mexico, and North Dakota—have passed constitutional amendments establishing permanent mineral trust funds. The term "permanent" means that a three-fourths vote of both

houses of the legislature is necessary before the principal can be disbursed for any purpose. Such precautions are designed to preserve the integrity of the principal. Colorado has a permanent trust fund established by statute that has no restriction on payments from its principal; however, the State has not yet spent any of the principal. In most States, the income from investment of the permanent trust funds is either deposited directly in the general fund or otherwise made available for legislative appropriation. Thus, these permanent trust funds, unlike the remainder of the severance tax revenues, do not contribute a large proportion to impact assistance.

Table 104 also shows the percentage of severance taxes placed in the State general funds. These percentages are relatively low (30 percent in North Dakota is the highest). The allocations to local governments represent direct distributions to communities, and do not include any remaining percentages indirectly available to these jurisdictions. In Montana, for example, impacted towns are directly allocated only 8.75 percent of revenues, but they could also receive indirect benefits from general fund disbursements, such as county planning appropriations, or cultural and historic site moneys.

In addition to mechanisms to dispense revenues, Wyoming has created several govern-

mental agencies to help mitigate the socioeconomic impacts. In 1974, the legislature passed the Joint Powers Act²² to encourage various levels of government to cooperate in the financing of public facilities. Local governments (e.g., cities, counties, school districts) can join together to become eligible for Joint Powers Loans.

In 1975 the legislature created the Wyoming Community Development Authority (WCDA) to help alleviate housing shortages.²³ It is designed to compensate for the lack of funds in the private mortgage lending market. WCDA is authorized to issue up to \$250 million in bonds that provide assistance through private lending institutions and through purchase of mortgages in areas of capital shortage. The program became fully operational in 1979 and more than \$200 million in WCDA bonds were committed as of the end of 1979.

Several other programs are valuable to jurisdictions with rapid growth. For instance, if a school district is nearing the limit of its bonded indebtedness and faces expenses beyond its financial capacity, it may apply to the Farm Loan Board for emergency construction funds. A \$2 million account within the Permanent Trust Fund is reserved for this purpose. In addition, the legislature has granted counties the authority to institute an additional 1-percent sales tax.²⁴ This tax must be distributed on the basis of population; as a result, cities and towns with increased population get a greater proportion of the revenue than counties.

State Energy Facility Siting Programs

While most States analyze the physical environmental effects of siting major energy facilities, only a few have developed programs

to deal directly with the socioeconomic aspects of this siting. Montana and Wyoming are two that have mechanisms specifically addressing such impacts. The primary aim of these programs is to ensure that industry participates in appropriate mitigation efforts.

The Wyoming Industrial Development Information and Siting Act was passed in 1975 largely in response to the social and economic conditions in boomtowns such as Rock Springs and Gillette. "The act requires that, prior to construction, major energy developers predict likely social and economic impacts and commit themselves to a number of monitoring and mitigation strategies. An Industrial Siting Council has broad latitude to determine compliance with an elaborate set of criteria. The council must approve all projects with a total cost of over \$63 million and certain other projects with the potential for substantial community or environmental impact.

The Montana Major Facility Siting Act²⁵ has a checklist of socioeconomic criteria requiring an applicant to give consideration to impacts on the population already in the area, on the population attracted by construction and operation of the facility, and on public services and facilities. Coal mines producing more than **500,000** tons per year, most electric generating facilities, and synfuels plants must obtain a siting certificate.

The Montana Board of Natural Resources and Conservation has discretion to place conditions on the siting certificate. For instance, in the case of the application for generating units 3 and 4 at Colstrip, the Board asked Montana Power to set up a training program for Northern Cheyenne Indians wishing employment in the construction and operation work force.

²²Wyo. Stat. §§9-1-129 through 136.

²³Wyo. Stat. §§9-18-101 through 123.

²⁴Wyo. Stat. §§39-6-412.

²⁵Wyo. Stat. §§35-1 2-101 through 121.

²⁶Mont. Rev. Codes Ann. §§75-20-101 through 1205 (1979 Supp.)

Effects of Expanded Federal Coal Production

Industrial development in sparsely populated rural regions inevitably brings changes in the established social patterns. These changes are seen as mixed blessings. On the one hand, a larger tax base, the expansion of retail services, and an improvement in public services are viewed as positive. On the other, housing shortages, crowding of facilities such as schools, and locally high inflation are seen as negative impacts. Residents respond in a variety of ways. Some welcome the changes as indications of prosperity; others lament them for the loss they bring to the earlier ways of life.

Whether communities are able to adapt to rapid growth depends on a complex set of elements, many of them site-specific. In any case, the combined efforts of private entities, especially the energy developers, and public agencies, particularly local and State governments, are necessary to deal with the changes.

The effects of expanded Federal coal leasing will depend on the **interaction** of many factors. These include:

- **Magnitude of the growth.**—The direct and indirect population influx from a large energy project may double or quadruple the size of a small rural community.
- **Pace of the development.** — Energy-related growth occurs suddenly and progresses rapidly, frequently with major impacts in the first few years of the development. Rural communities often are ill-prepared for this surge.
- **Fluctuating nature of the growth.**—During the construction period there may be large increases and decreases in population. The permanent operating force often is significantly smaller than the construction one. Communities must prepare for large temporary populations, especially in the case of powerplant construction.
- **Uncertainty.**—The timing of development is often uncertain because of changes in project economics and financing, shifts in State and Federal policy, and the risks associated with large energy projects. The unpredictable future of development makes initial investment in community facilities and services risky and difficult.
- **Condition of existing municipal services and facilities.**—Existing facilities have little excess capacity or elasticity. In addition, they may require extensive upgrading. The condition of many services and facilities is such that replacement may be required; and an isolated location usually means higher construction costs.
- **Availability of fiscal and other aid.**—Improvement of public **services** and facilities must occur during the early stages of industrial expansion; this takes place before an enlarged tax base is established. The front-end financing problem is usually one of timing rather than a long-term shortfall, since the increase in public revenues may ultimately exceed the total cost of municipal expansion. That the problem is one of timing rather than net loss in the long term, however, does not make it less severe.
- **jurisdictional problems.**—A new energy facility and the increased tax base it generates are frequently located in one political subdivision while the population settles in another. For example, energy facilities may be located in the unincorporated portions of counties (which derive revenues from the project), while the majority of new workers settle in adjacent towns (which legally cannot share in these revenues).
- **Private **sector [commercial] infrastructure.****—As in the public sphere, private sector services often require expansion; small towns generally have only basic commercial establishments. Lack of

capital. absence of experienced entrepreneurs, and competition with energy industries for labor and supplies can all contribute to delay in the expansion of local businesses.

- Characteristics of the region. —Some areas have experienced past booms and busts and are accustomed to their disruptive effects; others have not and the residents may be unprepared for boomtown problems.
- **Concurrent expansion of other industries in the same location.**—Many of the most severe problems have been associated not with coal mining, but with major powerplant construction. Although major disruptions in sparsely populated and homogeneous communities could occur from the number of mines and ancillary activities necessary to support large-scale coal production, the biggest problems will come from total energy development. Thus, the greatest potential for major socioeconomic dislocations exists where more than one energy-related development is expected.

The remainder of this chapter examines the potential for adverse social and economic consequences in the coal development regions studied by OTA. The State task force reports, from which the following discussions are drawn, include consideration of how socioeconomic conditions could influence Federal coal development. The task forces concluded that socioeconomic and community conditions would not be a significant constraint on the development of existing leases. This is because industry is concerned with problems such as labor turnover, and State and local governments have experienced some adverse consequences of coal-related growth. As a result, prospective developers and impacted communities will probably take appropriate steps to deal with any emerging problems,

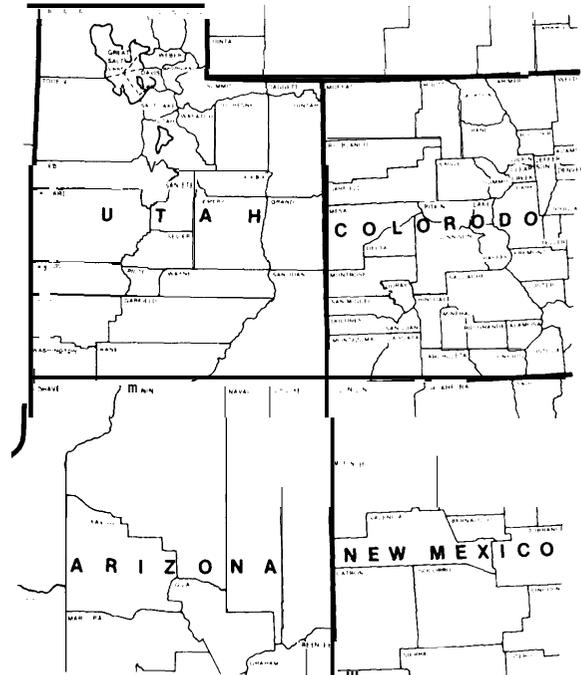
Colorado

To handle the negative effects of energy development, Colorado has adopted an impact

mitigation strategy involving local citizens, regional Councils of Governments, and a statewide office to coordinate efforts. The strategy has been successful in developing both public and private solutions to growth problems. Nevertheless, some communities have already experienced negative consequences from coal development, and the potential for future difficulties exists. OTA's estimates of potential production (see ch. 6) indicate that areas already experiencing problems are the most likely to face future difficulties.

The northwest and west-central are such regions (fig. 54 and table 105). For example, all eight of the proposed new lease tracts in Colorado are within 25 miles of Craig. The erection of two new coal-fired units at the Craig station, possible building of a synthetic fuels plant, and construction of major regional reservoirs in the next 10 years could

Figure 54.—Counties of the Rocky Mountain Study Area



SOURCE: Office of Technology Assessment.

Table 105.—Demographic Characteristics of Selected Counties in Colorado, Utah, and New Mexico

Colorado									
County	Total population ^a 1970	Total population ^a 1980	Percent change 1970 to 1980 ^a	Land area ^b (mi ²)	People per mi ^{2b}	Percent 65 years and older ^b	Total acreage of land in farms ^b (1,000 acres)	Percent of all land in farms ^b	Average size of farms ^b (acres)
Delta	15,286	21,225	38.90/o	1,154	15	18.90/o	282	38.1 0/0	338
Elbert	3,903	6,850	75.5	1,864	3	11.0	2,106	90.6	2,106
Garfield	14,821	22,514	51.9	2,996	6	10.5	397	20.7	1,161
Gunnison.	7,578	10,689	41.1	3,110	3	4.6	262	12.7	1,638
Jackson	1,811	1,863	2.9	1,622	1	8.4	470	45.3	5,114
Las Animas	15,744	14,897	- 5.4	4,794	3	15.6	2,118	69.0	5,205
Moffat	6,525	13,133	101.3	4,743	2	8.3	1,146	37.8	4,604
Montrose.	18,366	24,352	32.6	2,238	9	11.0	429	30.0	558
Ouray	1,546	1,925	24.5	540	3	9.7	157	45.5	2,097
Pitkin	6,185	10,338	67.1	973	9	2.8	49	7.8	1,016
Rio Blanco.	4,842	6,255	29.2	3,263	2	8.3	480	23.0	2,907
Routt	6,592	13,404	103.3 %	2,330	4	6.30/o	650	43.60/o	2,391
Utah									
Carbon.	15,647	22,179	41 .7%	1,476	12	10.3%	363	38.4%	2,523
Emery	5,137	11,451	122.9	4,439	1	9.9	219	7.7	589
Garfield	3,157	3,673	16.3	5,158	1	10.6	120	3.6	668
Kane	2,421	4,024	66.2	3,904	1	9.4	205	8.2	1,831
Sevier.	10,103	14,727	45.8%	1,929	6	18.1%	199	16.2%	483
New Mexico									
Colfax	12,170	13,706	12.6%	3,764	3	12.4%	2,269	94.2%	8,561
McKinley	43,208	54,950	27.2	5,454	9	4.4	3,363	96.4	28,264
Rio Arriba	25,170	29,282	16.3	5,843	5	8.0	1,468	39.3	2,531
Sandoval	17,492	34,799	98.9	3,714	6	7.6	790	33.2	3,249
San Juan	52,517	80,833	53.9%	5,500	12	5.3%	1,912	54.3%	4,698

a 1980 Census of population and Housing: Advance Reports, U.S. Bureau of the Census March 1981 (PHC80-V).
b 1975 data, City and County Data Book, U.S. Bureau of the Census, 1977

SOURCE: U.S. Bureau of the Census.

add to the population influx from coal development.

Craig has been handling growth for some time (the population of Moffat County has doubled since 1970) with the help of State impact assistance funds and professional city management. However, the amount of money that is returned to Craig from Federal royalties and State severance taxes is small compared to the revenues generated, and this disparity is a sore point with local leaders,

Nearby, at Hayden, the problem of fluctuating growth cycles can be seen. Expecting

new coal miners and construction workers to settle there, the town expanded its waterworks. But the growth failed to materialize, and now Hayden residents are having trouble paying the debt from this expansion. Similarly in Craig, the population dropped from layoffs at mines and from completion of unit 2 at the powerplant, but the voters have had to decide on a referendum for a \$7 million bond issue to double the current capacity of the water system.

Meeker illustrates the difficulties of planning ahead for growth. Work force estimates

for possible oil shale projects range from 2,200 to 3,600 people per facility; including families and secondarily induced service personnel, over 10,000 people could conceivably move to the town. If the oil shale endeavors proceed according to some plans, the area could experience a 400- to 600-percent increase in population by 1985.²⁷ The uncertainties associated with oil shale development, however, make it difficult to prepare for this growth. Concurrent expansion of coal production would add to these difficulties,

Rangely illustrates the problem of jurisdictional mismatches. This town, already the center for oil and gas development, is ready to absorb some new residents. Workers will come from the Federal oil shale tracts in Colorado once a road is completed. They are also apt to come from coal and oil shale developments in Utah, since Rangely is closer to these sites than Vernal, Utah. In this case, Rangely will bear the costs of accommodating the workers without the benefit of tax revenues from the properties.

Rio Blanco County has recently completed an agreement with Western Fuels Associates for impact mitigation. The company's proposed Deserado mine near Rangely will supply coal for a powerplant at Bonanza, Utah. Under the agreement, support will be provided for expansion of water and sewer facilities, schools, highways, and both municipal and county services (planning, medical, fire protection, recreation, and other services). The arrangements are based on the expected arrival of 1,500 new residents in the Rangely area. About \$15 million will go for mitigation; this is 5 percent of the projected \$300 million cost of the development,

In recognition of the fact that unpleasant living conditions lead to low productivity and high worker turnover, many energy developers have taken the initiative to help communities. Industry has contributed to the provision or upgrading of facilities and services, has assisted with housing development for workers, has prepaid taxes, and has taken

other steps such as offering training programs for local workers. For example, early in 1981, Northern Coal Co. announced it had arranged to build 18 apartments in Meeker as temporary housing for its employees. Approval has been given for a 104-lot development, sponsored by industry, for permanent housing. In addition, Northern Coal has prepaid \$318,500 in severance taxes to help fund municipal improvements.

Utah

Utah has two major coal regions with Federal leases—the Uinta region including Carbon, Emery, and Sevier Counties in the central part; and the Southwestern region encompassing Garfield and Kane Counties in southern Utah (fig. 54 and table 105).

The central area has historically been a coal producing region. Mining and related construction have been, and remain, the major economic activities. In the past, conditions in the coal market have had a direct effect on these counties. From 1950 to 1970, during depressed market times, they experienced declining populations. Since 1970, with an improved market, they have had significant growth: for instance, mining employment increased over 200 percent in Emery County in the first half of the 1970's.

There is disagreement over whether or not increased coal development will cause socioeconomic problems in central Utah. For example, in preparation of the DOI final environmental impact statement for coal development, the most extensive criticisms revolved around the social impact analysis.

The disagreements were also reflected in the OTA task force for Utah that reviewed the data for this assessment. The task force generally assumed that impacts could be dealt with adequately and community requirements would not be a factor discouraging mine development. *However, county commissioners and other local residents interviewed by OTA staff expressed concern about the capability of the area to absorb and support development without major disruption.*

²⁷Meeker's population was 1,597 in 1970 and 2,356 in 1980.

tion of existing communities and displacement of their ways of life; they cited loss of irrigated cropland and higher real estate assessments among their concerns.

The State government has adopted a policy to promote dispersed development. The intention is to spread the benefits and impacts of coal development more evenly and thus avoid the adverse consequences of more concentrated growth.

Development of coal leases in the Alton and Kaiparowits coalfields in southern Utah would require new or expanded facilities. The area is sparsely populated and rural, without large communities. Agriculture and tourism are the principal industries. A significant portion of the work force needed to operate coal mines would have to be brought into the area; new communities would have to be constructed to provide for the miners, support personnel, and their families.

One of the greatest concerns about coal development in Utah is the potential for change in the character of the communities. Many believe the entry of new residents would alter the generally homogeneous religious and cultural composition of the present social fabric. This perception of "outsiders" is a relatively recent development, and may stem in part from the residents' greater recognition of the magnitude of the development being proposed. The view residents have of activities elsewhere may also be contributing to their concern. In southern Utah the impression of the Price area (in the central part of the State) is that of a boomtown, similar to Rock Springs, Wyo. Many southern Utah residents feel that substantial changes in Price's character have taken place and they wish to avoid similar alterations. The possible changes in community composition or way of life are also a predominant concern behind much of the local opposition to the proposed MX missile system.

In sum, the potential for socioeconomic changes appears high in Utah, assuming that planned coal development proceeds. At the same time, there is widespread disagreement

as to whether these would be undesirable changes. Central Utah has been an historic coal mining area; booms and busts are not unknown to these towns. Southern Utah is sparsely populated and coal development would require establishing a different social and economic infrastructure to meet the needs of a larger and more , diverse population.

New Mexico

Like Utah, New Mexico has the potential for extensive socioeconomic changes, and the probability of these changes being negative appears high. The State recognizes the possible effects of industrial expansion on local government and has funded studies and projects in preparation for energy development. Large-scale expansion of coal mining and construction of powerplants or synthetic fuel projects in the San Juan basin could severely strain existing social and economic institutions. The problems would be particularly severe in remote coal regions where there are now few or no community facilities and services (table 105; fig. 54),

OTA's analysis (see ch. 6) indicates coal production could double or triple in the Star Lake-Bisti region (assuming the completion of the railroad). The towns of Cuba, Grants, and Milan would be most affected by the new mines and the construction, operation, and maintenance of the proposed Star Lake Railroad. Uranium and oil and gas development are also planned, and considerable public concern about the impact of uranium mining on the community of Grants has been expressed.

The town of Cuba is located near several new Federal coal developments; it is the closest community to the proposed La Ventana, Star Lake, and Black Lake mines. Cuba lacks the capability to provide the services needed to handle the expected growth. For example, water quality in this region is poor and its availability for domestic use is limited. Transporting water to Cuba from other parts of the State has been under study. The town is cur-

rently burdened with financial obligations, including \$651,000 in outstanding bonds, that limit its ability to underwrite new projects.

The Farmington, Bloomfield, and Aztec areas expect a construction boom that is projected to peak in 1985-86. A State Commission has established as high priority the repair and construction of new roads from the Farmington area to Cuba needed to handle the expected increase in coal traffic. In Farmington a housing shortage exists and water for residential use is not plentiful.

Because of the landownership patterns in New Mexico, off-reservation Indian lands and communities will be affected by the development of existing Federal leases. Mitigation efforts will require, in addition to State government participation, involvement of Tribal governments and local Indian pueblo councils, as well as consultation with DOI'S Bureau of Indian Affairs.

Wyoming and Montana

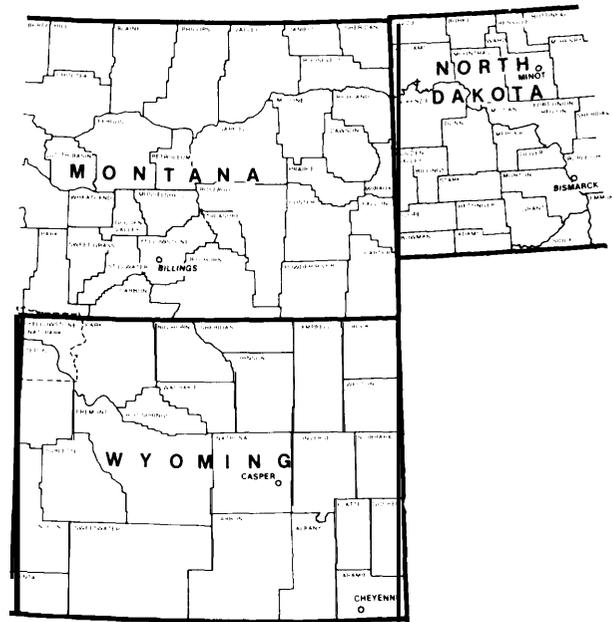
OTA focused on two regions in Wyoming and Montana: the Powder River basin, and southern Wyoming. A map of these areas and the nearby communities is found in figure 55; demographic indices are in table 106.

An early study of the socioeconomic impacts of increased coal development in the Northern Great Plains²⁸ reached the following conclusions:

- Population increases attributable to coal development will be large, and attendant problems will be compounded because such increases will be both rapid and unevenly distributed.
- Most communities in the Northern Great Plains are not prepared to deal with the magnitude of change attending regional coal development.
- The rapid influx of population will cause a proportionally greater increase in de-

²⁸Northern Great Plains Resource Program, 1974. This extensive study covered the five States of Montana, Nebraska, North Dakota, South Dakota, and Wyoming; it was funded in large part by the Department of the Interior.

Figure 55.—Counties of the Great Plains Study Area



SOURCE: Off Ice of Technology Assessment.

mand for services because newcomers often have higher expectations for services than native residents.

- Public service requirements will increase at a much faster rate than revenue collection, especially in the early years of development. The service areas of particular concern are housing, health care, and education.

These expectations were confirmed by subsequent experiences in the region. For example, Rock Springs, located in Sweetwater County in southwestern Wyoming, was the subject of a classic study of boomtown phenomena.²⁹ The population increased from 18,931 to 36,900 from 1970 to 1974. The ability to provide municipal and other local services declined markedly. The ratio of doctors

²⁹John S. Gilmore, and Mary K. Duff, *Boom town Growth Management: A Case Study of Rock Springs—Green River, Wyo.* (Boulder, Colo.: Westview Press, 1975).

Table 106.—Demographic Characteristics of Selected Counties in North Dakota, Wyoming, and Montana

County	Total population		Percent change 1970 to 1980 ^a	Land area ^b (mi ²)	People ^b per mi ²	Percent 65 years and older ^b	Total acreage of land in farms ^b (1,000 acres)	Percent of all land in farms ^b	Average size of farms ^b (acres)
	1970	1980							
North Dakota									
Bowman . . .	3,901	4,229	8.40/o	1,170	4	10.3%	712	95.6%	1,873
Burke	4,739	3,822	- 19.4	1,119	3	16.2	661	92.4	986
Grant	5,009	4,274	- 14.7	1,666	3	10.7	1,091	95.6	1,230
Hettinger. . .	5,075	4,275	- 15.8	1,134	4	11.3	758	99+	1,244
McLean	11,251	12,288	9.2	2,065	6	14.3	1,236	93.5	935
Mercer ., . . .	6,175	9,378	51.9	1,042	6	12.1	608	91.2	944
Oliver	2,322	2,495	7.5	721	3	7.6	419	90.9	1,072
Ward	58,580	58,392	- 0.3	2,044	30	7.4	1,256	96.0	881
Williams . . .	19,301	22,237	15.20/o	2,064	9	10.60/0	1,241	93.90/0	1,122
Wyoming									
Campbell. . .	12,957	24,367	88.1 %/0	4,756	3	5.0%	7,069	95.5 %/0	7,069
Carbon.	13,354	21,898	64.0	7,905	2	7.9	2,628	51.9	10,905
Converse . . .	5,938	14,069	136.9	4,281	2	9.6	2,440	89.0	8,904
Johnson . . .	5,587	6,700	19.9	4,175	1	15.2	2,127	79.6	8,645
Sheridan . . .	17,852	25,048	40.3	2,532	8	14.7	1,471	90.8	3,226
Sweetwater. .	18,391	41,723	126.90/o	10,429	3	6.40/o	1,764	26.40/o	16,640
Montana									
Big Horn . . .	10,057	11,096	10.3%	5,023	2	7.20/o	2,648	82.50/o	5,212
Madison . . .	5,014	5,448	8.7	3,528	2	13.1	1,191	52.8	3,103
Musselshell. .	3,734	4,428	18.6	1,887	2	15.1	1,210	99+	5,628
Rosebud . . .	6,032	9,899	64.1 0/0	5,037	2	6.50/o	3,009	93.30/0	8,798

^a1980 census of population and Housing, *Advance Reports*, U.S. Bureau of the Census, March 1981 (PCH80-V)

^b1975 data. *City and County Data Book*, U.S. Bureau of the Census, 1977.

SOURCE: Bureau of the Census.

to population changed from 1:1,800 in 1970 to 1:3,700 in 1974 (in contrast to an average statewide ratio of 1:1,100). In 1974, county schools were short an estimated 128 school-rooms; approximately 1,397 homesites had no municipal services; and 4,599 mobile-home spaces were needed. Caseloads in mental-health clinics increased eightfold. Crime rates increased by 60 percent between 1972 and 1973 alone, while police services remained relatively constant.

Other towns affected by nearby coal mining include Forsyth and Colstrip, Mont.; and Sheridan, Gillette, and Douglas, Wyo. Some of them have been better able to handle the impacts than others; and the mining company

mitigation efforts have been different in each community.

Colstrip was originally developed by the Montana Power Co., for its workers at the Rosebud Mine and the Colstrip Power Plants. Workers at Peabody's nearby Big Sky Mine had to commute daily from Forsyth, about 40 miles away. In the last few years, Montana Power has begun to transfer ownership of the town of Colstrip, and Big Sky Mine workers are purchasing houses there.

Sheridan, Wyo., has grown from mining developments around Decker, Mont. Workers at the East and West Decker and Spring Creek mines live in Sheridan although they work in

Montana. Sheridan has taken this growth in stride, although the county has difficulty obtaining sufficient funds for its general budget to meet operating expenses.³⁰ Increased housing costs, in large part from energy development, have created hardships for elderly residents on fixed incomes.³¹

Gillette, too, has had difficulty. During an oil boom in the 1960's, the adverse psychological effects of rapid growth were so pronounced that they came to be known as the "Gillette syndrome." Now, with coal development, careful planning appears to be controlling some of the problems seen in the earlier period. A new town, built to house workers at mines south of Gillette, was able to accommodate a population of 1,400 within 3 years after construction began.³²

Douglas, Wyo., which already has experienced rapid growth, will have substantial additional impacts with the development of new projects, and Rock Springs continues to show boomtown symptoms. Workers for the Jim Bridger, Black Butte, and Stansbury mines live there. The Wyoming Industrial Siting Council has asked industry to reevaluate the impacts of the Jim Bridger Mine and Power Plant on Rock Springs. The community is seen as an undesirable place to live and turnover is growing at the mines. The development of a better environment in Rock Springs "is a matter of good business," according to industry sources.³³

In summary, Wyoming has experienced some of the most extensive social and economic changes from energy development. Different communities have responded in different ways; some have become boomtowns, others have coped with rapid growth without excessive disruption. The State has developed a wide array of mitigation strategies to assist the affected counties and communities.

³⁰D. Pernula, "But What Happens When Coal's in Montana and Growth's in Wyoming?" *The Western Planner* 1(7):9 September 1980.

³¹P. Primack, "Expanding Energy Town Narrows Life for Elderly," *High Country News*, 11(19):1 Oct. 5, 1979.

³²R.E. Huff, "Wright's Success Reflects Commitment and Cooperation," *The Western Planner* 1(7):15 (1980).

³³Personal communication from J. Larsen, 1980.

The greatest potential for additional coal production from existing leases is in the Wyoming portion of the Powder River basin (see ch. 7), Campbell and Converse Counties, therefore, are the most likely to experience additional growth, and possible disruption from Federal coal development.

North Dakota

Coal mining on Federal land in North Dakota occurs in the Fort Union region in the western portion of the State. Most of the major mining operations are located in the four west-central counties of McLean, Mercer, Oliver, and Ward (see fig. 55). In recent years, Federal, State, and local governments have been major employers (28 percent of the population in 1975), with agriculture next (25 percent). Large farms and ranches, producing wheat and cattle, are characteristic. The largest urban area is Bismarck; small towns with stable populations are found throughout this part of the State (see table 106).

Rapid growth has already come to the towns of Beulah and Hazen. Energy developers in the Beulah area have pooled resources to provide housing for incoming workers, and Bismarck and nearby Mandan (within an hour's drive of the major lignite developments) have absorbed some of the new population.

There generally has been little local opposition to industry expansion in those areas where lignite mining and powerplant construction have already taken place (e. g., Oliver and Mercer Counties). This may be because much local income comes from the nearby mining operations. Negative public reaction has been pronounced in Dunn County, however. The combination of public opposition to the siting of Natural Gas Pipeline Co.'s (NGPL) planned gasification facility in the Dunn Center area and the lack of available air quality increments at Theodore Roosevelt Park led to NGPL's decision to abandon the project. To date, no large coal related facilities have been located in the immediate vicinity. The opposition of Dunn

County residents is shared by some Native Americans on the Fort Berthold Indian Reservation directly to the north of NGPL's proposed site.

Almost all of the existing Federal leases are in already developed areas (Mercer and Oliver Counties), Social and economic impacts are not likely, therefore, to affect the further development of Federal coal resources. This situation would change with the leasing of new tracts in previously undeveloped parts of the State. For example, the western edge of the State is an area where social and economic impacts from several ventures could accumulate. Oil and gas exploration is taking place here now, and although the operations are well removed from existing Federal lease areas, the potential exists for future problems.

Oklahoma

Federal coal leases are located in four counties in the east-central region of Oklahoma. Economic conditions are poor in this part of the State. A continuing decline in coal production since 1950 combined with a failure of other industries to flourish in this region has led to economic stagnation. Most civic leaders and many residents would welcome a rejuvenation of the coal industry.³⁴

³⁴This is documented in BLM's public participation file and was supported by individuals in private industry and in Federal and State agencies contacted during OTA's survey of the Oklahoma coal industry.

However, as discussed in chapter 6, the prospects are not encouraging for extensive development of coal on Federal land in Oklahoma during the 1980's.

Development of the Federal leases could require underground mining in many instances. However, surface mining has dominated the Oklahoma industry for the past two decades, and few local miners have had extensive underground experience. Consequently, the initiation of mining by the companies holding Federal leases would probably require the recruitment of workers from outside the State.

Four mines are currently operating on Federal leases. Any increase in population that might result if additional Federal leases were developed over the next 10 years would not impose an unmanageable burden on community services. The population of many towns is still smaller than when coal mining was more extensive. Most elementary and high schools could increase their enrollments without building new facilities or hiring new teachers, and health and recreational facilities are adequate. However, in several communities that have been hard hit by economic recession, commercial and residential buildings have deteriorated and would require extensive repair or replacement.