

CHAPTER 3

**Federal Coal Leases and
Preference Right Lease
Applications: An Overview**

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Federal Coal Leases and Preference Right Lease Applications: An Overview

As of September 30, 1980, there were 565 Federal coal leases in 14 States (see table 6). Ninety-seven percent of the total, or 548 leases, are located in seven Western States: Colorado, Montana, New Mexico, North Dakota, Oklahoma, Utah, and Wyoming. These 548 leases were examined by OTA in some detail. * Utah has 204 or 36 percent of all leases, more than any other State, Colorado and Wyoming have the next largest number of leases, 127 (22 percent) and 101 (18 percent) respectively. With 20 leases, North Dakota has the fewest leases among the seven States studied by OTA.

*OTA did not examine coal leases that have been relinquished or canceled and made only a limited review of leases outside this seven State region because of the small reserves involved. OTA did not study unleased Federal coal.

Table 6.—Extent of Leasing
(includes all leases in existence as of Sept. 30, 1980)

	Number of leases	Acreage under lease	Recoverable coal reserves (billions of tons)
Colorado	127 (22%)*	126,893 (16%)	2.2 (13%)
Montana	21 (4%)	37,286 (5%)	1.2 (7%)
New Mexico	29 (5%)	44,760 (6%)	0.45 (3%)
North Dakota	20 (4%)	18,692 (2%)	0.27 (2%)
Oklahoma	46 (8%)	74,046 (9%)	0.2 (1%)
Utah	204 (36%)	279,496 (34%)	3.2 (19%)
Wyoming	101 (18%)	217,273 (27%)	8.9 (54%)
Other States	17 ^b (3%)	13,555 (2%)	0.07 (0.4%)
Total	565 (100%)	812,001 (100%)	16.5 (100%)

^aAll percentages are percent of total leasing, sums may not add to 100 Percent because of rounding.

^bThe "other" leases include leases in Alabama (2), Alaska (4), California (1), Kentucky (3), Oregon (3), Pennsylvania (2), and Washington (2)

SOURCE: Office of Technology Assessment.

The 565 coal leases cover 812,000 acres of Federal land, 7 percent of the 11.5 million acres of Federal coal land classified as known recoverable coal resource areas (KRCRA) as defined by the Department of the Interior (DOI) in March 1978. Utah, Wyoming, and Colorado have a major proportion of leased acreage with 34, 27, and 16 percent respectively. North Dakota has the fewest leased acres among the seven principal States studied.

OTA estimates that 16.5 billion tons of recoverable coal reserves are now under lease in the seven States with 97 percent of the leases. Production from these reserves totaled 60 million tons in 1979 and 69 million tons in 1980; in the same years, total U.S. coal production was 776 million tons and 820 million tons, respectively.

Currently leased Federal reserves are less than 20 percent of the estimated total of over 80 billion tons of Federal recoverable coal reserves (see table 7). The percentage of total Federal coal reserves under lease in each State varies from a high of 50 percent in Utah to a low of 5 percent in Montana and about 3 percent in North Dakota. The percentages of federally owned coal to the total known recoverable coal reserves in each State vary from under 10 percent in Oklahoma to 85 percent in Utah with an average of about 60 percent for the seven States. *

Leases range from 40 acres to 20,701 acres. Approximately 60 leases are under 100 acres and 4 leases are over 10,000 acres in size. In terms of recoverable coal reserves, some small leases contain negligible amounts of coal (i. e., under 10,000 tons) while several large leases contain over one-half billion tons of recoverable coal.

*These percentages represent best available data on coal reserves and ownership, but these data are incomplete. See footnotes to table 7.

Table 7.—Leased, Federal, and Total Recoverable Coal Reserves in the Principal Western Coal-Producing States (all reserves shown in billion tons)

	Recoverable coal under lease ^a	Estimates of total Federal recoverable reserves ^b	Estimates of total recoverable coal ^c		Recoverable coal under lease ^a	Estimates of total Federal recoverable reserves ^b	Estimates of total recoverable coal ^c
Colorado	2.2	10	17	Oklahoma	0.2	0.2	2
Montana	1.2	26	40	Utah	3.2	6.4	7.5
New Mexico . .	0.45	4	9	Wyoming	8.9	26	36
North Dakota .	0.3	- 10	25 to 35	Total	16.5	- 83	- 140

^aLeased reserve figures from Automated Coal Lease Data System as modified by Office of Technology Assessment.

^bThe numbers in this column are estimates of the **total Federal recoverable coal reserves in each State**. The figure for New Mexico was supplied to Office of Technology Assessment by the New Mexico Bureau of Mines and Mineral Resources and the figure for Utah by the Utah Geological and Mineral Survey. See footnote c, below. The figures for the other states were estimated by multiplying the estimate of total recoverable coal in the State by the percentage of Federal coal acreage in Known Recoverable Coal Resource Areas in each State. These percentages were taken from table 21 in ch. 4 and are: Colorado (580/0), Montana (640/0), North Dakota (327.), and Wyoming (730/0). In Montana, the Federal percentage may be high because the KRCRAs do not include Indian reservations with significant reserves of coal. The Colorado percentage may also be high because the KRCRAs do not include the Denver-Raton Mesa coal region which has a high percentage of non-Federal coal ownership.

^cTotal State recoverable reserves from the following sources:

Colorado: Keith Murray, Colorado School of Mines Research Institute. Personal communication to Office of Technology Assessment, February 1981. The figure of 17 billion tons is based on his earlier work at the Colorado Geological Survey.

Montana: Montana Bureau of Mines and Geology as reported in the 1979 *Keystone Coal Industry Manual*. The figure of 40 billion tons was derived from the reported figure of 50 billion tons of strippable reserves and a recovery rate of 80 percent. This figure does not include 71 billion tons of underground demonstrated reserve base also listed in the 1979 *Keystone Coal Industry Manual* from data supplied by the U.S.B.M.

New Mexico: New Mexico Bureau of Mines and Mineral Resources, Personal communication to Office of Technology Assessment, August 1981. The figure does not include an additional 59 billion tons of recoverable underground reserves between 250 ft depth and 3,000 ft depth because insufficient information was available for the New Mexico Bureau to determine the portion of these reserves in seams that are likely to be mined in the next decade.

North Dakota: North Dakota Geological Survey, Personal communication to Office of Technology Assessment, August 1981. A recovery rate of 90 percent has been assumed by the North Dakota Survey.

Oklahoma: Friedman, S.A. *Investigation of the Coal Reserves in the Ozarks* Section of Oklahoma and their Potential Uses (Norman, Okla.: Oklahoma Geological Survey, 1975).

Utah: Utah Geological and Mineral Survey, Personal communication to Office of Technology Assessment, August 1981. The Utah Survey cautions that this figure is low, because it is based on stringent standards for identification and correlation of economically recoverable reserves.

Wyoming: Gary Glass, Wyoming Geological Survey, Personal communication to Office of Technology Assessment, August 1981. The above figure is derived from a surface reserve base of 26.3 billion tons with a recovery rate of 80 percent and an underground reserve base of 29.5 billion tons with a recovery rate of 50 percent. Glass cautions that the underground recovery rate of 50 percent may be too high for Wyoming.

General caution: The total recoverable coal reserve figures were obtained from seven different sources and are not based on uniform standards.

SOURCE: Office of Technology Assessment.

History of Leasing

Federal coal has been leased since enactment of the Mineral Leasing Act on February 25, 1920. The oldest lease still in effect, issued on January 17, 1921, originally covered 2,080 acres in Utah. Of the currently existing leases, 88 were issued before 1950 (see table 8). These include 16 percent of all existing leases, but only 5 percent of all land under lease as of September 30, 1980. Eighty-six percent of all leases covering 90 percent of all land under lease are at least 10 years old. *

*A total of 526 of the 565 existing leases were issued before Aug. 4, 1976, the date of enactment of the Federal Coal Leasing Amendments Act of 1976 (Public Law 94-377). Technically these are the "existing" leases subject to OTA scrutiny under sec. 10 of that law.

The number of leases and leased acreage increased slowly in the 1950's but accelerated sharply in the 1960's (see fig. 15). The solid line (number of leases) and the dashed line (acres under lease) in figure 15 cross around 1965 because of a trend during the 1960's to include larger acreages in single leases. The moratorium on most new leasing by DOI from 1971 through 1980 slowed leasing to the levels of the 1950's.

Historically, trends in Federal coal production did not coincide with trends in leasing. Production declined from 7.1 million to 5.4 million tons from 1950 to 1960 and remained at this relatively low level during the 1960's. Production during the 1970's has, however, soared from 7.3 million tons in 1970 to 69 million tons in 1980.

Table 8.—History of Leasing 1950-80*

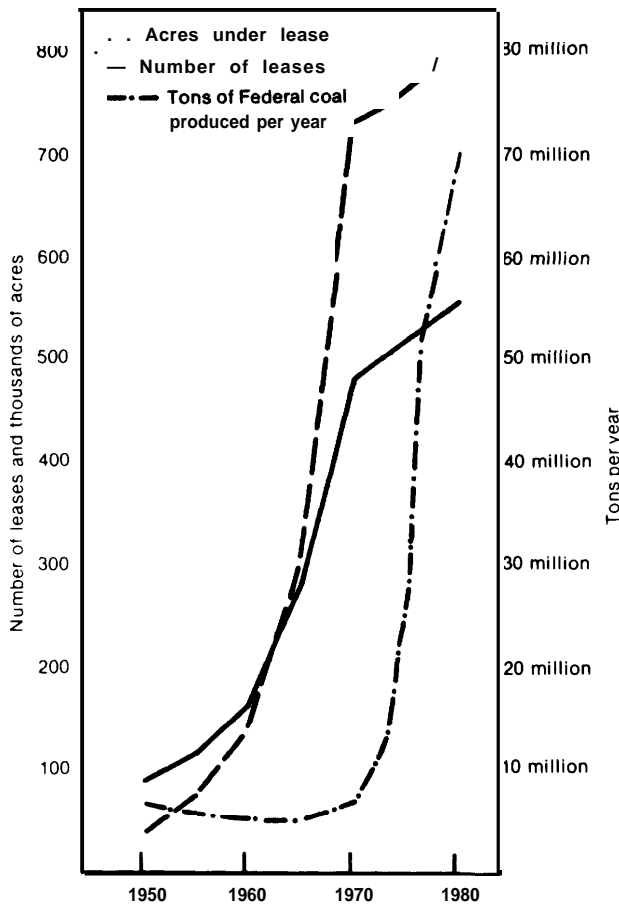
	Number of leases		Acres under lease	
1950	88	(16%) ^b	41,492	(5%)
1955	119	(21%)	75,949	(9%)
1960	166	(29%)	143,746	(18%)
1965	286	(51%)	308,354	(38%)
1970	485	(86%)	733,318	(90%)
1975	523	(93%)	764,994	(94%)
1980	565		812,001	

*Table includes only leases in existence on Jan 2 of each year listed 1950-75 and which were still valid on Sept. 30, 1980 The 1980 figures report all leases in existence on Sept. 30, 1980

^bpercentages are percent of 1980 totals.

SOURCE Office of Technology Assessment

Figure 15.—Number of Leases, Acreage Under Lease, and Federal Coal Production From 1950 to 1980



SOURCE Acreage and number of leases data from OTA review of DOI case files Federal coal production from the U S Department of Interior, *Federal Coal Management Report Fiscal Year 1978*, March 1979 and from the ACLDS

Lease Issuance Methods

Existing leases were issued by one of three methods: 1) competitive bidding at a lease sale, 2) noncompetitive preference right leasing, or 3) segregation of an existing lease (also called partial assignment).

The Mineral Leasing Act of 1920 requires DOI to lease competitively public land known to contain commercial quantities of coal. Several bidding procedures have been used in the past, including sealed written bids and open verbal auctions. Leases have been awarded to the party offering the highest one-time cash bonus payment. Other bidding methods besides the cash bonus procedure may be used for future leasing. Although these lease sales were open to all bidders, more than half of all lease sales held before 1979 attracted only one bidder. In total, 52 percent of all existing leases have been issued under the lease sale method (see table 9).

Preference right leasing under the 1920 leasing act was limited to land without known commercial quantities of coal for which additional prospecting work was needed to determine the existence of economically minable coal deposits. In these cases, applicants could receive a prospecting permit from DOI to perform exploration and drilling. If coal was found in commercial quantities within the 2-year permit period (extendable once), the prospector was entitled to a preference right lease. As an incentive to promote exploration of public lands, no bonus was required on preference right leases. Of all existing leases, 42 percent were issued under the preference right method.

In 1971, DOI suspended issuance of new prospecting permits and delayed processing

Table 9.—Lease Issuance Method for Existing Leases

Issuance method	Number of leases	o/o of leases
Lease sales	294	520/o
Preference right ,	237	420/o
Segregation	34	60/o

SOURCE Off Ice of Technology Assessment

of pending preference right lease applications (PRLAs). In 1976, in the Federal Coal Leasing Amendments Act, Congress repealed provisions for preference right leasing, subject to valid existing rights. The preference right program no longer exists except for the applications for leases based on the prospecting permits issued prior to the 1971 leasing moratorium (nearly all dating from 1967 to 1971). Applications for leases were not completely processed by DOI when the moratorium began; processing largely ceased during the moratorium and resumed in late 1979. (About 176 applications remain.) These PRLAs are discussed in more detail in the next section.

Another leasing procedure is called segregation or partial assignment. Here, an existing lease is divided into two or more parcels at the request of the lessee(s). Such actions require the approval of DOI. A new lease(s) is then issued for the new tract(s) and the terms of the surviving lease are modified to reflect a reduced acreage. Only 6 percent of outstanding Federal leases have been created by segregation.

Pending PRLAs

As of January 1, 1980, there were 176 pending applications for preference right leases. They stem from prospecting permits issued between 1955 and 1971—with 172 (98 percent) originating after January 1, 1965. These permits expired just before or shortly after the initiation of the leasing moratorium in 1971 and the resulting lease applications were neither approved nor denied. They have remained unprocessed for a decade, although they have been the subject of lawsuits, Government studies, and congressional actions.

Nearly 98 percent of the PRLAs are located in the seven Western State region studied by OTA (see table 10). The remaining four are in Alaska. In total, 403,800 acres of Federal coal land are included in PRLAs and involve an estimated 5.8 billion tons of recoverable coal reserves. Wyoming, with 74 PRLAs, has the largest number of applications. They in-

Table 10.—Extent and Location of PRLAs

	Number of PRLAs	Acreage	Recoverable coal reserves (billions of tons)
Colorado	37 (21%) ^a	82,923 (21%)	1.0 (18%)
Montana	4 (2%)	14,673 (4%)	0.3 ^b (6%) ^b
New Mexico	28 (16%)	77,600 (19%)	1.5 (26%)
North Dakota	0 (0%)	0 (0%)	0 (0%)
Oklahoma	4 (2%)	5,956 (1%)	b
Utah	25 (14%)	75,598 (19%)	0.4 (6%)
Wyoming	74 (42%)	139,210 (34%)	2.5 (43%)
Alaska	4 (2%)	7,840 (2%)	0.1 (1%)
Total	176	403,800	5.8

^aAll percentages equal percent of total for all PRLAs.
^bFigures for Montana and Oklahoma combined.

SOURCE: Number of PRLAs and acreage from OTA review of DOI case files. Reserves from Automated Coal Lease Data System, Sept. 30, 1979 and reported in U.S. Department of the Interior, *Federal Coal Management Report*, March 1980.

clude 43 percent of the reserves and 34 percent of the acreage in all PRLAs. Colorado ranks second with 37 PRLAs including 18 percent of total reserves and New Mexico is third with 28 PRLAs including 26 percent of the reserves.

Acreages and reserves under the PRLAs are substantial. If all the applications are approved and converted to leases, total land under lease will increase by 50 percent and leased recoverable coal reserves will be raised by 35 percent.

Most of the legal and administrative problems preventing the processing of the PRLAs have been resolved in recent years. The current Federal coal lease management program adopted by DOI in July 1979 calls for the processing of the applications to be completed by 1984. Environmental, legal, and technical considerations could lead to the rejection of some of the PRLAs or result in acreage modifications or the addition of lease stipulations which restrict subsequent coal mining. These issues are discussed in more detail in chapter 9.

Lease or PRLA Acquisition Methods

Although each lease or prospecting permit was originally issued by DOI, there are several other methods by which the present owners have obtained leases or PRLAs.

The issuance of a lease or prospecting permit by the Federal Government is termed in this study *de novo* leasing or permitting. OTA found in a study of the 538 leases and 176 PRLAs outstanding as of September 30, 1979, that only 117 leases (22 percent of the lease total) and 19 PRLAs (11 percent of the total PRLAs) are still held by the original owner (see table 11). The remaining 78 percent of all leases and 89 percent of all PRLAs have been obtained by their present owners from previous owners through one of two methods: 1) assignment and 2) segregation.

Owners of leases or PRLAs may sell or transfer their contracts to other parties with approval of DOI. This process is called assignment. Assignments are essentially private transactions and any cash, property, service agreements, or overriding royalties are, with few limitations, between the buyer and seller.

Table 11.—Lease and PRLA Acquisition Method Used by Present Owner

Acquisition method	Number and percent of leases	Number and percent of PRLAs
De novo	117 (22%)	19 (11%)
Assignment	403 (75%)	133 (76%)
First	- 146	-76
Second	- 124	-27
Third or more	- 133	-30
Segregation	18* (3%)	24 (14%)

*The "Segregation" total in this table differs from the number (34) listed in table 9 because eight segregated leases were subsequently assigned to their present owners. Also, table 9 includes 27 leases issued in late 1979 and in 1980. These leases were not included in the above analysis.

SOURCE: Office of Technology Assessment.

Approximately 75 percent of the outstanding leases and PRLAs were obtained by their current owner through assignment. Multiple assignments have been made on many leases and PRLAs; 124 leases have been assigned twice and 133 have changed hands three or more times. The 176 PRLAs have been assigned a total of **227** times.

Segregation, already discussed in this chapter (see table 9), has been used by the present owners of 18 leases and **24** PRLAs. Like assignments, segregations are largely transactions among private parties that are then recorded by the Federal Government.

Control of a coal lease or PRLA can be obtained without actually acquiring title through the *de novo*, assignment, or segregation procedures. This involves the purchase of a controlling interest in a firm which already owns leases or PRLAs. The acquired firm can then become a subsidiary of the purchaser and the purchaser is able to make decisions affecting the leases or PRLAs. Although transfers of title by assignment from the acquired company to the purchasing company often occur, they are not obligatory.

Corporate mergers and acquisitions have frequently involved leases and PRLAs. For example, at least 10 of the **36** leaseholding companies now operating as wholly owned subsidiaries once held leases as independent corporations. As another example, in 1980 three firms holding leases were purchased by major energy companies. Because lease title transfers do not always accompany corporate acquisitions, it is difficult to precisely determine the role of mergers in the leasing program; however it is clearly significant.

Ownership of Leases and PRLAs

Ownership of leases and PRLAs is shared by a number of unincorporated individuals and by a variety of diverse companies. Owners range from sole proprietors to joint

ventures involving some of the largest corporations in the world. *

*Lease and PRLA ownership patterns and trends from 1950 to 1980 are discussed in greater detail in ch. 13. Lease owner-

About 115 corporations own coal leases or indirectly control them through subsidiaries or joint ventures. In addition, as of January 1, 1980, 59 individuals held leases in their own name. As of January 1, **1980, 29** companies and **18** individuals owned PRLAs.

Electric utilities hold 21 percent of all outstanding acreage under coal lease as of September **30, 1979**, more than any other single business category defined by OTA. Seventeen utilities now own leases. Eleven of the **18** largest oil companies (i.e., the oil majors) control 20 percent of leased acreage. Seven other business activity categories own leases covering at least 5 percent of all land under lease, ranging from 8 percent owned by Peabody Coal Co. (the largest single lessee) to 5 percent owned by nonresource-related diversified companies such as General Electric or Monsanto (see table 12 and ch. 13).

Unincorporated individuals hold **20** percent of all land included in PRLAs, more than any of the eight business categories identified by OTA as major PRLA holders. The major energy companies rank second, with 16 percent. Other principal holders of PRLAs include natural gas pipeline, metals, oil or gas, and electric utility companies.

OTA found that lease and PRLA holders represent one of four types of business organizations. Most of the acreage under lease (43 percent) and under PRLA (44 percent) is held by subsidiaries of larger parent companies. Only 26 percent of all leased land and **12** percent of land under PRLAs is controlled by independent firms. Multicorporate enti-

Continued from p. 51.

ship is discussed in considerable detail in the OTA Technical Memorandum Patterns and Trends in Federal Coal Lease Ownership: 1950-80, OTA-TM-M-7, March 1981.

Table 12.—Major Business Activity Categories Holding Federal Coal Leases and PRLAs in 1980a

	Percent of leased land	Percent of land included in PRLAs
Electric utilities	21%	9%
Energy companies	20	16
Peabody Coal Co.	8	(In "other") (less than 5%)
Steel companies	8	0
Independent coal companies.	7	(In "other") (less than 5%)
Oil and gas (minor) companies	6	8
Unincorporated individuals . . .	5	20
Natural gas pipeline companies	5	12
Nonresource-related diversified companies	5	(In "other") (less than 5%)
Kemmerer Coal Co.	4	10
Metals and mining companies.	2	9
Landholding companies	<1	1
"Other" companies.	10	14

^aThe office of Technology Assessment analyzed separately any business activity category (including individual companies with unique business structures) holding at least 5 percent of all land under lease or PRLA at at least 1 of 7 analysis dates between 1950 and 1980. (See ch. 13). The analysis includes the 538 leases and 176 PRLAs in existence as of Sept. 30, 1979.

^bIn March 1981, Kemmerer Coal Co. was purchased by Gulf Oil Corp.

SOURCE: Office of Technology Assessment

ties, such as joint ventures, are the newest business organizations to control significant public coal land; they hold 25 percent of leased land and 22 percent of land under PRLAs. Finally, unincorporated individuals control 5 percent of land under lease and 20 percent of land under PRLAs.

Over the past 30 years, there has been a general decline in the percentage of leases and PRLAs held by small independent companies and unincorporated individuals. The proportion of leases held by large diversified firms and companies operating on leased land through subsidiary and multicorporate arrangements has risen. There has also been an increase in the number of different industries holding major shares in Federal leasing. The number of business categories holding at least 5 percent of all land under lease grew from four to nine between 1950 and 1980.

Lease Development Status

A principal objective of this study is to examine mining activity on Federal leases and to assess the development potential of ex-

isting leases and PRLAs. During this analysis OTA divided the existing leases into units or blocks. A lease unit, as used by OTA, consists

of either all leases included in the same active or proposed mine as defined by the mine plan, or one or more undeveloped leases that are owned by the same lessee and that are contiguous or sufficiently close together to form a compact minable unit. *

OTA divided the 565 existing coal leases into 256 units (see table 13). The smallest units contain one lease covering 40 acres. The largest, located in southern Utah, includes 21 leases and 40,277 acres. Colorado, Utah, and Wyoming together account for 176 lease units, 69 percent of the total.

OTA evaluated mining activity and mine development prospects for the 244 lease units located in the seven principal Western coal-producing States listed in table 13. The lease units were grouped in three categories according to stages of development. Each of the categories required a different type of data collection and analysis. The three development categories are:

- leases with approved mine plans;
- leases with mine plans submitted and pending approval; and
- leases without submitted mine plans.

Leases and lease units were placed in these categories based on OTA's review of all mine plans on file with the Office of Surface

*See ch. 2 for more information on the OTA methodology.

Table 13.—Number and Location of Leases and Lease Units

State	Number of leases	Number of lease units
Colorado	127	66
Montana	21	13
New Mexico	29	15
North Dakota	20	14
Oklahoma	46	26
Utah	204	56
Wyoming	101	54
Other States	17	12
Total	565	256

SOURCE Office of Technology Assessment

Mining (OSM) on September 30, 1980. * The number of leases and lease units, acreage, and recoverable coal reserves in each of the three categories is shown in table 14 (see also fig. 9 in ch. 1). Information in this table is summarized below.

Leases With Approved Mine Plans

Approximately one-third of all leases and all lease units have approved mine plans. Many of the mines in this category are actively producing; however, some mines only recently received permit approval and have not yet begun commercial operations. The approved category also includes a small number of new leases issued in 1979 and 1980 to ensure the continued operation of existing mines (even if the approved mine plan has not yet been formally modified to add the new leases) and several leases included in pending amendments to approved mine plans.

In Montana, 54 percent of the lease units, containing 69 percent of the leased reserves are in approved mine plans (see table 15). New Mexico and Oklahoma have the smallest percentage of lease units in the approved category and Oklahoma and Utah the lowest percentage of leased reserves in the approved category.

Before a lessee can mine coal from a Federal lease, DOI must approve the proposed mining operation. Because only a por-

*Before coal can be produced from Federal land, a mine plan must be submitted to and approved by DOI. Hence, mine plan status provides a convenient yardstick by which to measure lease development. There are two separate requirements for mine plans for Federal leases. First, a mine plan must be submitted to comply with the general provisions and regulations under the Mineral Leasing Act of 1920 (MLA), as amended, and secondly, a mining and reclamation plan must be submitted for all surface and underground mines to comply with the Surface Mining Control and Reclamation Act of 1977 (SMCRA) whether or not Federal lands are involved. Under DOI directives, a single mining plan is submitted to OSM to meet both MLA and SMCRA requirements, however, OSM and the Geological Survey each retain their separate responsibilities for enforcement and permit approval.

Table 14.—Summary Table—The Development Status of Federal Coal Leases^a

	Approved mining plans (including leases in production)				Pending mine plans				No mine plans			
	Number of leases	Number of units	Number of acres	Recover- able reserves billions of tons	Number of leases	Number of units	Number of acres	Recover- able reserves billions of tons	Number of leases	Number of units	Number of acres	Recover- able reserves billions of tons
Colorado	54 (43%) ^b	19 (29%)	42,086 (33%)	0.73 (32%)	21 (17)	11 (17%)	37,855 (30%)	0.46 (21%)	52 (41%)	36 (55%)	46,953 (37%)	1.06 (47%)
Montana	14 (67%)	7 (54%)	30,292 (81%)	0.83 (69%)	0	0	0	0	7 (33%)	6 (46%)	6,994 (19%)	0.37 (31%)
New Mexico	9 (31%)	2 (13%)	18,827 (42%)	0.17 (38%)	9 (31%)	3 (20%)	21,098 (47%)	0.18 (40%)	11 (38%)	10 (67%)	4,835 (11%)	0.10 (22%)
North Dakota	8 (40%)	4 (29%)	8,655 (46%)	0.12 (44%)	4 (20%)	3 (21%)	5,283 (28%)	0.10 (37%)	8 (40%)	7 (50%)	4,754 (25%)	0.05 (19%)
Oklahoma	7 (15%)	5 (19%)	8,668 (12%)	<0.01 <(5%)	1 (2%)	1 (4%)	680 (1%)	<0.01 <(5%)	38 (83%)	20 (77%)	64,698 (87%)	0.18 >(90%)
Utah	50 (25%)	14 (25%)	55,540 (20%)	0.79 (24%)	78 (38%)	11 (20%)	118,740 (42%)	1.27 (39%)	76 (37%)	31 (55%)	105,215 (38%)	1.19 (37%)
Wyoming	47 (47%)	23 (43%)	110,193 (51%)	4.7 (53%)	5 (5%)	3 (6%)	11,007 (5%)	0.53 (6%)	49 (49%)	28 (52%)	96,073 (44%)	3.6 (41%)
Other States	9 (53%)	7 (58%)	5,476 (40%)	0.02 (29%)	0	0	0	0	8 (47%)	5 (42%)	8,079 (60%)	0.05 (71%)
Total	198 (35%)^c	81 (32%)	279,737 (34%)	7.4 (45%)	118 (21%)	32 (13%)	194,663 (24%)	2.5 (15%)	249 (44%)	143 (56%)	337,601 (42%)	6.6 (40%)

^aSee also table 6 in this chapter and fig. 9 in ch. 1.^bPercentages are percent of totals within the State, for each State.^cPercentages are percent of totals for all States

SOURCE: Office of Technology Assessment.

Table 15.—Leases in Production and With Approved Mine Plans

	Number of leases	Number of lease units	Acres	Recoverable reserves (billions of tons)
Colorado	54 (43%) ^a	19 (29%)	42,086 (33%)	0.73 (32%)
Montana	14 (67%)	7 (54%)	30,292 (81%)	0.83 (69%)
New Mexico	9 (31%)	2 (13%)	18,827 (42%)	0.17 (38%)
North Dakota	8 (40%)	4 (29%)	8,655 (46%)	0.12 (44%)
Oklahoma	7 (15%)	5 (19%)	8,668 (12%)	<0.01 <(5%)
Utah	50 (25%)	14 (25%)	55,540 (20%)	0.79 (24%)
Wyoming	47 (47%)	23 (43%)	110,193 (51%)	4.7 (53%)
Total	189 (34%)	74 (30%)	274,261 (34%)	7.4 (45%)

^aPercentages are percent of total for each State except percent of total which is percent of seven State total.

SOURCE: Office of Technology Assessment.

tion of the approved permit area is mined in any given year, it is unlikely that all Federal coal leases in approved mine plans will be producing at one time. In 1980, coal was mined from about 100 Federal leases, which is about half of the leases in the approved category. Sixty-nine million tons of coal were mined from the producing leases in the seven Western State OTA study region (see table 16). Federal coal contributed 34 percent of all production from these States. In 1980, Federal coal provided 66 percent of Utah's entire output, 36 percent of Wyoming's production, but only 3.5 percent of the coal mined in North Dakota and only 5 percent of the coal mined in Oklahoma.

Leases With Pending Mine Plans

Approximately 21 percent of all leases and 15 percent of leased reserves are included in

Table 16.—1979 and 1980 Coal Production From Federal Leases and From Western States

	1979 production from Federal leases (millions of tons)	1979 total State coal production (millions of tons)	Percent of State coal output from leases, 1979	1980 production from Federal leases (millions of tons)	1980 total State coal production (millions of tons)	Percent of State coal output from leases, 1980
Colorado	7.7	18.1	43%	9.4	19.5	48%
Montana	8.6	32.5	26	10.4	36.1	29
New Mexico	5.4	15.1	36	6.3	16.5	38
North Dakota ...	1.1	15.0	7	0.6	17.2	3
Oklahoma	0.3	4.8	6	0.3	4.9	5
Utah	6.9	11.8	58	8.7	13.1	66
Wyoming	30.1	71.8	42	33.4	94.0	36
Other States ^a ..	(0.14)	(178.8)	(less than 1%)	(small)	(—)	(less than 1%)
Total^b	60.1	169.1	36%	69.1	201.4	34%

^aIncludes Federal production from Kentucky, **Alabama, and Washington.**

^bTotal does not include contribution from "other" States.

SOURCE: 1979 Federal production from U.S. Geological Survey accounting office. 1979 State production from the U.S. Energy Information Agency, *Weekly Coal Production Report*, Aug. 16, 1960.

1960 Federal production from U.S. Geological Survey, *Federal and Indian Lands Coal, Phosphate, Potash, Sodium and Other Mineral Production, Royalty Income, and Related Statistics*, June 1981. 1960 State production from the U.S. Energy Information Agency, Personal Communication to the Office of Technology Assessment, July 27, 1961.

the 13 percent of all lease units for which mine plans have been submitted to OSM and for which Federal approval is pending. This classification does not distinguish among lease units on the basis of quality of submitted mine plans, their date of submission, or the current stage of the review of the mine plan.

New Mexico, Utah, and North Dakota each have 20 percent of their lease units falling in the pending mine plan category. On the other hand, no pending mine plans affecting Montana leases are being studied by DOI and only 1 of Oklahoma's 26 lease units is included in a pending mine plan (see table 17).

Leases Without Mine Plans

Over half of all existing lease units, 44 percent of all leases, 42 percent of all leased

Table 17.—Leases With Pending Mine Plans

	Number of leases	Number of lease units	Acres	Recoverable reserves (billions of tons)
Colorado	21 (17%) ^a	11 (17%)	37,855 (30%)	0.46 (21%)
Montana	0 —	0 —	0 —	0 —
New Mexico	9 (31%)	3 (20%)	21,098 (47%)	0.18 (40%)
North Dakota ...	4 (20%)	3 (21%)	5,283 (28%)	0.10 (37%)
Oklahoma	1 (2%)	1 (4%)	680 (1%)	<0.01 (<5%)
Utah	78 (38%)	11 (20%)	118,740 (42%)	1.27 (39%)
Wyoming	5 (5%)	3 (6%)	11,007 (5%)	0.53 (6%)
Total	118 (21%)	32 (13%)	194,663 (24%)	2.5 (15%)

^aPercentages are percent of total for each State except percent of total which is percent of seven State total.

SOURCE: Office of Technology Assessment

acreage, and 40 percent of leased reserves have not been developed to the point of a mine plan submission to OSM.

Preliminary development activity varies widely on these undeveloped units, from extensive exploration drilling and mine plan preparation on some units to no activity at all on others (see ch. 6).

Oklahoma has the largest proportion of Federal coal leases without mine plans, and five of the seven Western States have over 30 percent of their leased Federal reserves in this category (see table 18). Sixty-seven percent of New Mexico's lease units have no mine plans, but they cover just 22 percent of leased reserves.

Table 18.—Leases for Which No Mine Plans Have Been Submitted

	Number of leases	Number of lease units	Acres	Recoverable reserves (billions of tons)
Colorado	52 (41%) ^a	36 (55%)	46,953 (37%)	1.06 (47%)
Montana	7 (33%)	6 (46%)	6,994 (19%)	0.37 (31%)
New Mexico	11 (38%)	10 (67%)	4,835 (11%)	0.10 (22%)
North Dakota	8 (40%)	7 (50%)	4,754 (25%)	0.05 (19%)
Oklahoma	38 (83%)	20 (77%)	64,698 (87%)	0.18 (>90%)
Utah	76 (37%)	31 (55%)	105,215 (38%)	1.19 (37%)
Wyoming	49 (49%)	28 (52%)	96,073 (44%)	3.6 (41%)
Total	241 (44%)	138 (57%)	329,522 (41%)	6.6 (40%)

^aPercentages are percent of total for each State except percent of total which is percent of seven State total.

SOURCE: Office of Technology Assessment.