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Oil and Gas Royalty Recovery Policy on Federal and Indian Lands[†]

INTRODUCTION

Government income from oil and gas production on federal and Indian lands has increased dramatically in recent years (Table 1). In 1980, gross income from royalties, lease sales, and rents was \$8.1 billion.¹ In 1970, the same earnings were less than \$1.4 billion.² Through the 1980s, oil and gas revenues are projected to increase an average of 15 percent per year.³ By 1990, government energy earnings are expected to be \$14 billion annually.⁴

The importance of these revenues has increased with their growth. They are the largest non-tax source of income for the states, the Indian tribes, and the federal government.⁵ These revenues are used for education, for health-care, and for other social needs. Their reduction can cause budgetary trauma and can result in vital programs and services being lost.

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[†]Ron Michelson of the Minerals Management Service, Department of the Interior (previously the Conservation Division, U.S. Geological Survey), and Robert Boldt, Associate Deputy Director of Royalty Management, Minerals Management Service, were helpful in illuminating the federal government's views on royalty management. Jan Stevens, Deputy Attorney General of California, and Jean Abadie and Jim Lowrey, California State Controller's Office, were helpful in explaining the western states' perspective. Tom Wright and Margaret Rourke, of Chevron USA, illuminated the industry's views. Patricia Inouye, Government Documents Librarian (UCD), was helpful in finding obscure government publications. Geoffrey Wandesforde-Smith and Angus MacIntyre reviewed several drafts. Any omissions, errors, and conclusions are ours alone. Finally, we are indebted to LOGIC SYSTEMS, Carmichael, Cal., for word processing software and hardware.

1. U.S. GEOLOGICAL SURVEY (hereinafter referred to as USGS), FEDERAL AND INDIAN LANDS OIL AND GAS PRODUCTION, ROYALTY INCOME, AND RELATED STATISTICS 1-390 (June, 1981) and USGS OUTER CONTINENTAL SHELF STATISTICS 1-92 (June 1981).

2. *Id.*

3. Revenue estimates are updated weekly by the Office of Management and Budget (hereinafter cited as OMB) and by the Minerals Management Service (hereinafter cited as MMS). Interview with Bruce McFarland, Royalty Accounting, MMS (Feb. 22, 1982).

4. Revenue growth is expected to occur primarily from inflation and deregulation of natural gas.

Id.

5. In 1980, 23 states received \$316 million from federal oil and gas royalties; 33 Indian tribes, or allottees, earned \$164 million; and the federal government received \$7.6 billion. USGS *supra* note 1. The distribution of oil and gas revenues from federal lands is discussed in: S. L. McDONALD, THE LEASING OF FEDERAL LANDS FOR FOSSIL FUELS PRODUCTION 6-23 (1979). Appendix 1 (this article summarizes the sources and distributions of oil and gas revenues for federal and Indian lands).

TABLE 1

Distribution of revenues from oil and gas production on federal and Indian lands, 1970 and 1980. Values in millions of dollars. From: "Federal and Indian Lands Oil and Gas Production, Royalty Income, and Related Statistics," and "Outer Continental Shelf Statistics," June 1981, USGS.

1970	Product Value (mil \$)	Royalties, Rents, Etc. (mil \$)	Bonuses (mil \$)	% Earnings of Product Value Within Borders	% Earnings of Total Product Value	% Earnings of All Royalties Collected	% Earnings of Total Revenue Collected
States	796	48*	0	6	1.8	11.8	3.6
Tribes	121	16	?	13.2	0.6	3.9	1.2
Treasury	1708	344	945	51.5	49.1	84.3	95.3
TOTALS:	2625	408	945	NA	51.5	100	100
Total revenue collected (1970) = \$1353							
Total federal share (1970) = \$1289							
1980	Product Value (mil \$)	Royalties, Rents, Etc. (mil \$)	Bonuses (mil \$)	% Earnings of Product Value Within Borders	% Earnings of Total Product Value	% Earnings of All Royalties Collected	% Earnings of Total Revenue Collected
States	5122	317*	22	6.2	1.7	11.0	3.9
Tribes	698	111	53	23.8	0.9	5.7	2.0
Treasury	13056	2476	5105 +	41.8	40.3	85.3	94.1
TOTALS:	18867	2904	5180	NA	42.9	100	100
Total revenue collected (1980) = \$8084							
Total federal share (1980) = \$7603							

*This is 1/2 of the gross royalties collected within state borders (onshore), and is the net amount actually received by the states.
 + This value includes \$900 million for windfall-profit taxes collected in 1980.

On January 12, 1981, the *Los Angeles Times* reported that oil theft and fraud were widespread problems on federal and Indian lands.⁶ Before long, other newspapers published similar reports.⁷ By May, 1981, preliminary drafts of a General Accounting Office (GAO) report: "Oil and Gas Royalty Collections—Longstanding Problems Costing Millions," were being circulated in government offices.⁸ This was the sixth GAO report criticizing minerals management in 30 years.⁹

The target of the GAO report was the Conservation Division of the U.S. Geological Survey (USGS). As an agency of the Department of the Interior (DOI), it had responsibility in 1981 for minerals management on public and Indian lands.¹⁰ The Division was being accused of royalty

6. Losses were reported on the Wind River Indian Reservation in Wyoming. They were alleged to be only "a small part of a \$3 billion to \$5 billion scam involving oil and gas operations on federal and Indian lands in as many as 12 states." *L.A. Times*, Jan. 12, 1981, § 4, at 1, col. 1.

7. On January 15, 1981, admitted "errors" were reported on the Wind River Indian Reservation involving \$21,000 in underpaid royalties. *L.A. Times*, Jan. 15, 1981, § 4, at 1, col. 6. By early February the Reservation underpayment problem had grown to \$117,000. *Washington Post*, Feb. 1, 1981, at A17, col. 1. In March, five indictments were handed down by a federal grand jury for alleged conspiracy and theft of 7,000 barrels of oil in Cheyenne, Wyoming. *L.A. Times*, Mar. 21, 1981, § 3, at 18, col. 1. Two weeks later, underpayments and site security violations were reported at leases across the country. *N.Y. Times*, Apr. 4, 1981, at 7, col. 1. On April 12, CBS Television aired "Oil Boys and Indians," and exposé on oil theft and fraud on Indian lands. *60 Minutes*, Vol. XIII, no. 30. On April 15, more errors were reported, involving 453,000 barrels of oil and \$2.4 million in underpaid royalties. *N.Y. Times*, Apr. 15, 1981, at A26, col. 3. By the first week in July, the federal government was blamed for mismanaging royalty collections and the oil and gas industry was admonished for its greed and corruption. *Washington Post*, July 2, 1981, at B17, col. 2. On July 16, the Secretary of the Interior appointed a select commission to study allegations of mismanagement, theft, and fraud. Its chairman, D. F. Linowes, estimated that federal royalty losses might be as high as 7–10 percent of successfully collected revenues each year. *Washington Post*, July 16, 1981, at A3, col. 2. In late August, oil losses of \$1 million a day were reported. *L.A. Times*, Aug. 28, 1981, § 1, at 6, col. 1. In December, extensive oil thefts were reported on private lands in Texas. *L.A. Times*, Dec. 18, 1981, § 9, at 10, col. 1.

8. OMB, General Accounting Office (hereinafter cited as GAO), OIL AND GAS ROYALTY COLLECTIONS—LONGSTANDING PROBLEMS COSTING MILLIONS (Oct. 1981).

9. Between 1969 and 1977 the Department of the Interior (hereinafter cited as DOI), Office of the Inspector General, published 5 similar reports. See Appendix 2 for a full listing of the GAO and OIG reports.

10. The Conservation Division of the USGS (now the Minerals Management Service) implements and enforces operating rules for conservation and production, monitors leases for compliance with statutes and regulations, develops reports on lease operations and sales, and collects and records payments due the federal government and Indian tribes. 43 C.F.R. §§ 211, 221, 231, 250, 270 (1981). The Bureau of Land Management (hereinafter cited as BLM) and Indian Affairs (hereinafter cited as BIA) administer all mineral lease tract nominations and sales, environmental assessments, and lease documents maintenance. *Id.* at §§ 3100, 3300; 25 C.F.R. §§ 211–215 (1982) (for the BLM); 25 C.F.R. §§ 183, 184 (1982) (for the BIA). General enabling authority for minerals management on federal and Indian lands is the Mineral Leasing Act of 1920, 30 U.S.C. §§ 181 *et. seq.* (1976 & Supp. V 1981), the Acquired Lands Leasing Act of 1947, 30 U.S.C. §§ 351 *et. seq.* (1976 & Supp. V 1981), the Outer Continental Shelf Lands Act of 1953, 43 U.S.C. §§ 1331 *et. seq.* (1976 & Supp. IV 1980), the Mining and Minerals Policy Act of 1970, 30 U.S.C. § 21(a) (1976), and the Natural Gas Policy Act of 1978, 15 U.S.C. §§ 3301–432 (Supp. V 1981). 25 U.S.C. §§ 396, 398 (1976) cover the BIA's responsibility for Indian allotted oil and gas leases.

mismanagement, of maintaining an obsolete accounting system, and of failing to collect all royalties due the federal government each year.¹¹

Apprehension over these charges has led to investigations,¹² proposals for reform,¹³ and lawsuits.¹⁴ On July 8, 1981, the Secretary of the Interior established the Commission on Fiscal Accountability of the Nation's Energy Resources, chaired by D. F. Linowes (also known as the Linowes Commission).¹⁵ Its task was to examine allegations of massive irregularities in royalty payments, to investigate allegations of oil theft from federal and Indian lands, and to make recommendations for improving fiscal accountability of the nation's energy resources.¹⁶

11. In 1978, after three years of study, the Conservation Division implemented a new Royalty Accounting System (RAS). The new system replaced a single-entry, non-self-balancing accounting system that had been used since 1925. Problems with the old approach had led to speculation that royalty losses might be 7-14 percent of successfully collected revenues each year. Newspaper articles, *supra* note 7; DOI, *infra* note 17 at 16; OMB *infra* note 65. See also J. ABADIE, MANAGEMENT EVALUATION REPORT ON ROYALTY MANAGEMENT IN THE CONSERVATION DIVISION (USGS), DOI 4 (Controller's Office, State of California, 1981).

In 1980, the RAS was expanded to a state-of-the-art computer approach called the Improved Royalty Management Program (hereinafter cited as IRMP). In 1981, its implementation was delayed. This led to development of an Interim Operating System (hereinafter cited as IOS) and an emergency contingency plan.

It is now estimated that the IRMP will not be operational until 1985. MMS, DOI (Improved Royalty Management Work Group) INTERIM OPERATING SYSTEM—SYSTEMS PLAN REPORT (1981). Arthur Andersen & Company has testified that efforts to implement the program will be "massive and complex." Unless "substantial additional planning and design can be performed to insure that the program [moves] forward in a well controlled manner, there is a high risk that schedule slippage or outright failure [of the system] may occur." Testimony of Arthur Andersen & Co. before the Linowes Commission (Oct. 19, 1981).

12. Between February and August 1981, the Senate Select Committee on Indian Affairs held four hearings on federal supervision of oil and gas leases on Indian lands. In August, 1981, the Senate Energy and Natural Resources Committee met on the collection, accounting, and distribution of mineral royalties on federal and Indian lands. In April, 1981, the House Committee on Government Operations, Subcommittee on Commerce, Consumer, and Monetary Affairs, met to discuss the administration of windfall-profit taxes and USGS oil and gas royalty collection practices. Between September and December 1981, the House Interior and Insular Affairs Committee, Oversight and Investigations Subcommittee and Mines and Mining Subcommittee, convened three joint hearings on royalty management. DOI, *infra* note 17, at 285-90.

13. In the spring of 1981, the Western Attorney Generals Association, the Interstate Oil Compact Commission, and the Western States Land Commissioners Association sent resolutions to the Secretary of the Interior urging his acceleration of plans to upgrade the nation's minerals management system. They also urged him to conduct look-back audits of the nation's royalty accounts (unpublished private correspondence).

14. On May 26, 1981, on behalf of Ken Corey, Controller of California, civil action no. 81-1217 was filed in District of Columbia district court alleging that significant royalty losses were occurring and that the Secretary of the Interior was not discharging his responsibilities to collect all mineral revenues that were due. Ten western states supported California's complaint as friends of the court (interview with Jon Stevens, Deputy Attorney General, State of California, Feb. 19, 1982). On Aug. 17, 1981, the Secretary filed a brief in answer to California's charges, and on August 25, he answered the state's interrogations.

15. 46 Fed. Reg. 36,952 (1981).

16. *Id.*

On January 21, 1982, the Commission submitted its report,¹⁷ which stated that the performance of the Conservation Division “had become a severe embarrassment to the Department [of the Interior].”¹⁸ The report concluded that:¹⁹

- the USGS system does not verify data reported by oil and gas companies,
- the USGS’s lease-account records are so unreliable that the agency often does not know which companies have paid and which have not,
- lessees’ records are seldom audited or critically reviewed,
- late payments are common, and
- penalties for underpayments of royalties scarcely exist.

On January 19, 1982, the Secretary of the Interior abolished the Conservation Division and replaced it with a new Minerals Management Service (MMS).²⁰

In reorganizing the nation’s minerals management system, the Secretary of the Interior began sweeping and costly reforms based upon his perception that large royalty losses are occurring and that large recoveries will be made. Estimates place losses at 7–14 percent of successfully collected revenues each year.²¹ All currently available estimates are based upon extrapolations from single case reviews and upon personal opinions by expert witnesses at hearings. No objective estimates of revenue losses have been made, and no complete analysis of likely recoveries has been done.

In this paper, we examine three areas identified by the Linowes Commission where the most serious royalty losses are alleged to occur: 1) errors in reporting the quality and quantity of oil and gas produced, 2) difficulty in determining the “fair market value” of production, and 3) outright theft and fraud.²² We examine the data to evaluate the context in which losses occur, to estimate how much might be recovered if proposed reforms are implemented, and to assess possible impacts on the DOI, the states and Indian tribes, the oil and gas industry, and the public at large. Our aims are to outline the complexities of royalty management,

17. DOI, REPORT OF THE COMMISSION ON FISCAL ACCOUNTABILITY OF THE NATION’S ENERGY RESOURCES (D. Linowes, Chairman) (January 21, 1982).

18. *Id.* at 147.

19. *Id.* at 15.

20. The new Service is distinct from the USGS. Reorganization establishes the Minerals Management Board, composed of the Under Secretary of the Interior and the Assistant Secretaries of Policy, Budget and Administration, Indian Affairs, and Energy and Minerals. The Board is to conduct interim management, monitor progress of the Service, and report final plans for reorganization to the Secretary by 12/31/82. 47 Fed. Reg. 4,751 (1982).

21. ABADIE, *supra* note 11, at 4; DOI, *supra* note 17, at 16; and GAO, *infra* note 65, at 16.

22. DOI, *supra* note 17, at 13–39.

to focus attention on the weakest links in the present system (namely, sound data gathering, accounting, and management practices), to conduct a net benefits assessment of proposed reforms, and to offer a positive description of likely consequences recent changes may have.

QUALITY AND QUANTITY PROBLEMS

Crude oil and gas occur in a variety of forms.²³ When royalty payments are calculated, corrections to a quality standard must be made. Crude-oil corrections are made by measuring the specific gravity of the oil (at a constant temperature), then correcting for the amount of water and sediment contained.²⁴ Natural gas corrections are made by measuring the volume of gas at a standard temperature and pressure²⁵ or by measuring its BTU content²⁶ after natural gasoline, propane, butane, and other liquid "contaminants" have been removed. Quality determinations are straightforward once corrections to the standard have been made.

Quantity determinations are derived from sales rather than based upon the amount of product produced from a field.²⁷ Sales volumes are determined by gauging differences in tanks of known capacity before and after a sale, or by moving crude oil through a lease-automatic-custody-transfer (LACT) meter which records the amount sold. Natural gas is metered as it is delivered to a pipeline²⁸ once it has been cleaned.

Minerals Management Service field inspectors (previously Conservation Division personnel) are responsible for measuring and reporting the quality and quantity of oil and gas production on federal and Indian lands.²⁹ Because of a shortage of qualified personnel, the Service has

23. Crude oil can be heavy or light, depending upon its specific gravity. Oil or natural gas can be sweet or sour, depending upon the amount of sulfur dioxide and other contaminants contained. Natural gas can be wet or dry, depending upon its liquid hydrocarbon content.

24. 30 C.F.R. § 221.43 (1981).

25. C.F.R. §§ 221.44-46 (1981).

26. *I.e.*, the thermal value of the gas. DOI, *supra* note 17, at 24.

27. Sales volumes are used rather than production volumes for several reasons. First, measurements of actual production rates are unreliable because they can vary from well to well and because production from several wells is often pooled into a common holding tank or pipeline. Second, individual wells are often started and stopped for maintenance and conservation reasons. This introduces additional variance into overall well production. Finally, estimates of what production rates should be (based on steadily declining field production curves) are unreliable. This is because conservation regulations do not establish minimum extraction rates. Estimates that are based on declining field production curves assume maximum extraction rates. Because fuel stocks are sometimes more valuable in the ground than in production, extraction rates less than the maximum allowable sometimes occur. K. BRADLEY, *THE ECONOMICS OF CRUDE PETROLEUM PRODUCTION* (1976) and Uhler, *Oil Reserves Prices*, Resources Paper No. 68, Univ. of British Columbia (1981). Thus, market determinations of production rates confound estimates based on geophysical properties of fields.

28. 30 C.F.R. § 221.44 (1981).

29. In 1981, there were 63 inspectors for 17,522 onshore leases having over 55,000 wells. There were also 75 inspectors for 1,240 offshore leases (DOI, *supra* note 17, at 34). 30 C.F.R. §§ 221.57, 221.12 (1981) define MMS inspection responsibilities.

had to rely upon industry supplied figures for many years.³⁰ This has hampered independent verification of quality and quantity data and has led to criticisms that cheating and losses occur. The Linowes Commission has concluded that "underreporting of production may be a substantial factor in royalty losses."³¹

The data show that underreporting of quantity and quality does occur. In the late 1970s two of nine audits conducted on OCS gas leases by the Inspector General's Office discovered \$172,000 in underreported royalties.³² In the early 1970s, audits of 10 percent of one USGS office's accounts revealed \$362,000 in underreported royalties.³³ A GAO investigation between 1974 and 1977 found \$156,000 in underreported royalties after comparing company sales receipts with petroleum production figures.³⁴ Recent investigations have discovered over \$1 million in underreported royalties on Indian lands. The largest sum (\$750,000) was lost by the Wind River Indian Reservation in Wyoming over a period of nine years.³⁵

FAIR MARKET VALUE PROBLEMS

Crude oil prices are determined by the offers refiners make for feedstocks and the amounts producers accept. Transactions are posted weekly in official trade notices and represent an equilibrium value between spot supply and demand. Prices are a function of oil quality, its distance from a refiner, and overall market conditions. Many hold "price posting" to be competitive,³⁶ but sometimes "fixing" is alleged.³⁷

The Secretary of the Interior can establish his own price for oil,³⁸ however, he usually uses the "posted price" (or the highest selling or offered price) as the fair market value.³⁹ In 1980, the average price paid for oil from federal and Indian lands was \$23.73 per barrel.⁴⁰

Natural gas valuation is more complex than oil valuation because its production, transportation, and pricing have been regulated since the industry began.⁴¹ Today, there are "27 different controlled prices for inter-

30. 30 C.F.R. § 221.43(d) (1981) authorizes this practice.

31. DOI, *supra* note 17, at 20.

32. *Id.* at 20-21.

33. *Id.*

34. *Id.*

35. *Id.* at 22.

36. Ramsey, *Bidding and Oil Leases*, 25 CONTEMPORARY STUDIES IN ECONOMIC AND FINANCIAL ANALYSIS 152-171 (1980).

37. One such example is an anti-trust suit involving several Southern California producers which has been pending for over five years. Interview with Jan Stevens, Deputy Attorney General, California (Feb. 19, 1982).

38. This is done solely for royalty calculation purposes under 43 C.F.R. §§ 3103.3-4(d) (1981).

39. 30 C.F.R. § 221.47 (1981).

40. *Supra* note 1.

41. *See, for example*, ENERGY FUTURE 56-78 (R. Stobaugh and D. Yergin, eds.) (1979); DAVIS, ENERGY POLITICS 87-114 (1978); ENGLER, THE POLITICS OF OIL 310-340, 372-394, 428-482 (1961).

state sales."⁴² This complexity has hampered the valuation of natural gas.⁴³

Another problem with valuing natural gas is that it is often delivered on long-term sales contracts. More than half of the current contracts on federal and Indian lands are over 10 years old.⁴⁴ Some of these deliver gas for 21 cents per MCF.⁴⁵ In 1980, the average contract price for federal and Indian gas was \$1.70 per MCF.⁴⁶ Price differences have caused serious problems among lessors, lessees, and regulators.⁴⁷

The Linowes Commission has concluded that undervaluation of natural gas is the nation's most serious royalty management problem.⁴⁸ The data show that undervaluation of lessee-used gas, improper application of retroactive price controls, and improper deductions of allowable expenses have caused the most serious problems. Table 2 summarizes the worst cases for the past 10 years.⁴⁹ Total losses are just over \$35 million. Most have occurred on the outer continental shelf (OCS) rather than on continental lands.

THEFT AND FRAUD PROBLEMS

Rising petroleum values since 1974 have made onshore crude oil a profitable target for thieves.⁵⁰ Natural gas is not a good target for theft

42. DOI, *supra* note 17, at 23. Some price controls will be phased out under the Natural Gas Policy Act (15 U.S.C. §§ 3301 *et seq.* (1982)).

43. For example, natural gas can be flared, lost, re-injected, or used on site. Until recently, royalties were paid under any of these conditions. These categories are now exempt from payment (Amoco Production Co. v. Cecil D. Andrus, 527 F. Supp. 790 (1981)), and refunds of previously paid royalties must be made, 47 Fed. Reg. 20,672-20,673 (1982). Expenses for transportation, cleaning costs, and other deductibles are allowed under present valuation practices. Depending upon the original quality of the gas, its proximity to a pipeline, and the means of transportation used, deductions can vary widely. Finally, natural gas can be valued by volume, by BTU content, by weight, and by other means. Different approaches are sometimes used in different parts of the country. DOI, *supra* note 17, at 24.

44. Interview with Robert E. Boldt, Associate Deputy Director of Royalty Management, MMS (Feb. 17, 1982).

45. *Id.*

46. *Supra* note 1.

47. Lawsuits have been filed that challenge the distinction between "contract price" and "fair market value." Some courts have upheld lessors' interpretation that "fair market value" means "the current market price." J. M. Huber Corp. v. Denman, 367 F. 2d 104 (5th Cir. 1966); Foster v. Atlantic Ref. Co., 329 F. 2d 485 (5th Cir. 1964); Texas Oil & Gas Corp. v. Vela, 429 S.W. 2d 866 (Texas 1968). Others have said that "fair market value" is the product price at the time the contract was signed. See, Scully, *The Market Price Gas Royalty Clause: Lessee's Nightmare Outside Oklahoma—Tara Petroleum Corp. v. Hughey*. 35 SW. L.J. 1079 (1980). Recent DOI regulations propose that "fair market value" should be the highest price allowed under Federal Energy Regulatory Commission regulations at the time the product is delivered. 47 Fed. Reg. 16,423-426 (1982).

48. DOI, *supra* note 17, at 23.

49. These data are adapted from the Linowes Commission Report (DOI *supra* note 17) and several GAO and OIG reports (Appendix 2).

50. Onshore crude is easily loaded and transported and is readily moved across state borders. It is difficult to trace and its per-unit value is high. One truckload of stolen oil can bring \$5,000 or more (DOI, *supra* note 17, at 27-33).

TABLE 2

Natural gas audits on federal and Indian lands (worst cases shown for 1966–1981). Adapted from Appendix E, the Linowes Commission Report and from several GAO and OIG reports (Appendix 2).

Type of Problem	Years	Amount Received (in millions)	Location
Undervaluation of lessee-used gas	1972–1976	\$ 2.123	OCS
	1972–1978	0.245	OCS
	1972–1978	7.621*	OCS
Undervaluation of gas sold	1973–1977	0.025	OCS
	1972–1978	0.044	OCS
Improper deductions of allowable expenses	1980–1981	12.000*	OCS
Improper application of pricing methods	— — —	0.572	onshore
	1966–1977	2.200	— —
	1974–1977	10.044	onshore
Failure to report lost or injected gas	1974–1977	0.156	OCS
Total amount recovered =		\$35.030	

Royalties collected for oil and gas on all federal and Indian lands: (values in millions).

Years	All oil and gas	Gas only
1966–1976	\$5,648.3	\$1,497.4
1972–1978	6,379.1	1,918.0
1966–1978	8,395.6	2,872.0

* = on appeal

because it is difficult to transport and store. OCS oil and gas are virtually immune from theft because they are produced at inaccessible locations.

Onshore crude oil or condensate can be stolen in two ways: by removal of waste oil (or diverted good oil) from waste oil pits, and by removal of production oil from on-site storage tanks. Either method involves diversion of oil before its sale. Since “production” is a derived measure based on sales rather than upon the amount actually produced, diversion prior to sale is especially hard to detect. Prevention can be accomplished only by maintaining adequate site security.⁵¹ In 1980, a crash inspection program revealed security breaches which could have enabled theft at 82 percent of the sites inspected.⁵²

51. *I.e.*, correct piping, metering devices, and locks on valves.

52. DOI, *supra* note 17, at 27 (17,812 onshore production sites were inspected).

Once oil is stolen, it must be successfully transported off site. MMS field inspectors have no police authority and have not been able to stop illegal activities in the oil fields. County sheriffs have been too thinly spread to monitor trucking effectively. Only federal marshals have jurisdiction on Indian lands. Removal of stolen oil has become routine.

Fraud, or "paper theft," can occur when bookkeeping procedures are lax. It has been suggested that "run tickets" may be falsified,⁵³ that gravity and impurity measures may be forged,⁵⁴ and that completion of wells may not be promptly reported.⁵⁵ All of these crimes require a sophisticated network of communication, record keeping, and conspiracy to be maintained. It is unlikely that their impact could be substantial or widespread.

The extent of theft and fraud on federal and Indian lands is unknown. The Linowes Commission has concluded that "the [USGS] management system lacks fundamental enforcement tools,⁵⁶ [and that] thefts are occurring [which] deserve serious national attention."⁵⁷ The data show that some losses do occur. For example, in 1978, a USGS field inspector first noticed increased trucking activity in Wyoming oil fields.⁵⁸ In 1981, arrests were made for two small thefts near Thermoplis, Wyoming. Four men eventually pleaded guilty to taking \$7,000 in crude and condensates.⁵⁹

"A former oil thief, turned State's evidence in Kern County, California [reported] that he had stolen, or hired others to steal, \$1 million worth of crude in two weeks."⁶⁰ An official at a fuel oil distribution company reported losing \$70,000 of product in one week.⁶¹ A former FBI official who now directs oil field security for an independent oil company estimates that his firm's losses are six percent of annual production.⁶² Other private security officials estimate that losses for their firms might lie between two and six percent per year.⁶³ Arrests and convictions have occurred for oil thefts in Oklahoma, New Mexico, and California, but most have been for violations on private land.⁶⁴

53. *Id.* at 32.

54. *Id.*

55. *Id.*

56. *Id.* at 33.

57. *Id.* at 26.

58. Testimony of George Campbell before the Committee on Interior and Insular Affairs, Subcommittees of Mines and Mining and Oversight Investigations (September 23, 1981).

59. DOI, *supra* note 17, at 29.

60. *Id.*

61. *Id.*

62. *Id.*

63. *Id.*

64. *Id.* at 27.

ANALYSIS

In 1979, the GAO reported that "royalties are normally understated by 7–10 percent each year."⁶⁵ This figure was generalized from a single 1977 audit. As a result of implementing the GAO's 1979 recommendations, the USGS was able to recover only \$10.1 million, or .84 percent of the \$1.2 billion it collected in 1977.⁶⁶

In 1981, a GAO report claimed that "hundreds of millions of dollars may be going uncollected each year."⁶⁷ Yet, in 1980, with five percent of the Conservation Division's most suspected accounts audited, only \$7.7 million, or less than .03 percent of the total royalties collected in 1980, were recovered from unpaid accounts.⁶⁸ There is a significant discrepancy between alleged losses and recoveries that have been prudently made.

Officials agree that estimating royalty losses is difficult. Data quality is poor, and "the amount of underpayment [or overpayment] is uncertain since the government's royalty records are too unreliable to provide an [accurate] estimate."⁶⁹ In 1980, roughly half of the 26,769 USGS accounts showed underpayment while the other half showed overpayment.⁷⁰ A former Director of Royalty Management for the Conservation Division testified before the Linowes Commission that "the precise figure [of underpayment] is probably impossible to determine."⁷¹ Estimates that do exist are probably overstated since they "rest on a small base [of] individual [cases] that were specially selected for audit."⁷² Some have concluded that "[USGS] balances are virtually worthless."⁷³

An Inspector General of the DOI testified before the Linowes Commission that royalty underpayment might be 3.5 percent of total receipts each year.⁷⁴ The Associate Deputy Director of Royalty Management for the MMS estimates that total losses may be \$200–300 million since 1950, and that present losses may be \$20–50 million each year.⁷⁵ These estimates differ by almost 100 percent and are considerably less than the 7–10 percent estimated by the GAO. Each one percent different represents

65. GAO, OMB, "Oil and gas royalty collections—serious financial management problems need congressional attention," at 16 (1979).

66. *Id.* and *supra* note 1.

67. DOI, *supra* note 17, at 16. Also, testimony of M. J. Socolor, Acting Controller General of the United States, before the Linowes Commission on August 27, 1981 (emphasis added).

68. DOI, *supra* note 17, at 25.

69. *Id.* at 16.

70. *Id.* at 18.

71. *Id.*

72. *Id.* at 17.

73. *Id.* at 18.

74. *Id.* at 16.

75. Interview, *supra* note 44.

a revenue value of approximately \$30 million based on 1980 royalty collections. An improved method of estimating royalty losses is desirable.

One approach toward improving royalty loss estimates is to summarize the findings of all previously successful underpayment collections. This approach will render a high estimate if audits and desk reviews were biased toward suspected accounts.

Table 3 shows USGS billings and collections for 1977–80. Approximately \$41 million in underpaid royalties were recovered. By subdividing recoveries for the past 10 years, losses for underreporting, undervaluation, and theft and fraud can be shown. Less than one percent of successfully collected annual royalties are lost to underreporting by applying this method (Table 2). Losses from natural gas undervaluation are no more than 1–2 percent of annual collections from natural gas, and are less than 0.6 percent of the royalties collected on all oil and gas each year. Losses from theft and fraud are insignificant compared with total royalty receipts. Summarizing these findings across all collections shows that approximately one percent of successfully collected royalties have been underpaid in the last 10 years.

This approach renders a significantly lower loss estimate than is usually seen. It can be criticized because GAO and OIG investigations have not sought losses, *per se*. Instead, they have sought system-wide problems in the Conservation Division. Since USGS figures do not reflect systematic cycle audits but show balances from standard field reports (Table 3), this approach may not reflect actual losses despite its bias toward suspected accounts.

Another approach toward improving royalty loss estimates is to utilize figures recently obtained by states. Several states, acting under cooperative agreements with the MMS, have sought to recover their own losses.⁷⁶ Desk reviews and field audits have been on going for six⁷⁷ to eighteen months.⁷⁸ Data have been compared from federal and state tax forms and attention has been focused on leases that show large balances or a history of problems. New Mexico is the only state that can completely evaluate all of its accounts or conduct a random sample.

Table 4 summarizes the states' findings to date. Losses have been discovered for undervaluation, for underreporting, for nonreporting, and for improper application of royalty rates. Total collections exceed \$42

76. Participating states are: California, Colorado, New Mexico, North Dakota, Wyoming, Montana, and Utah. They are reviewing MMS records from the past 6 years and are billing lease holders for unpaid amounts. Interviews were conducted with state officials (Sept. 13–14, 1982).

77. For California, Colorado, Montana, North Dakota, and Utah. Interviews were conducted with various state officials (Sept. 13–14, 1982).

78. For New Mexico and Wyoming. Interviews were conducted with various state officials (Sept. 13–14, 1982).

TABLE 3
U.S. Geological Survey Oil and Gas Audits, Reconciliations, and Payments, 1977-1980

YEAR	Anchorage AK	Casper WY	Los Angeles CA	Motaine LA	Roswell NM	Tulsa OK	Washington DC	TOTALS
1977								
Number of lease account audits and reconciliations	115	57	—	—	202	55	18	447
Number of collection letters	—	822	14	156	166	38	15	1211
Payments (thousands of \$)	—	1900	.09	442	288	57	6	2694
1978								
Number of lease account audits and reconciliations	411	104	31	729	931	229	31	2466
Number of collection letters	6	873	40	81	717	85	21	1823
Payments (thousands of \$)	2	1509	88	10408	1786	212	7	14014
1979								
Number of lease account audits and reconciliations	361	235*	59	780	289*	1037*	29	2790
Number of collection letters	18	1100	27	29	272	142	17	1605
Payments (thousands of \$)	51	1818	48	8421	1471	1075	42	12927
1980								
Number of lease account audits and reconciliations	141	51*	153	219	368*	1506*	77	2515
Number of collection letters	24	355	11	31	294	213	49	977
Payments (thousands of \$)	1561	4278	20	2531	1063	1446	45	10944

*includes Indian leases

Total onshore royalties collected 1977-1980 = \$7612.5 million (*supra*, note 1).

TABLE 4
Underpaid Royalties Recovered by States After Review of Federal Oil and Gas Royalty Records (1982-83)

State	Number of Federal Leases	Average Gross Annual Royalties 1977-80 (millions)	Cooperative Agreement	Amount Billed To Date (millions)	Amount Collected To Date (millions)	Extent of Record Review (years)
Wyoming	7000 +	\$158.2	yes	15	10*	6+
New Mexico	7400 +	156.5	yes	14	0	6+
California	355 +	43.4	yes	8	5*	6+
Colorado	800 +	31.1	yes	4	3.3*	6+
Utah	850 +	30.5	yes	0.5	0	6+
North Dakota	450 +	13.5	yes	1	0	6+
Montana	1100 +	13.2	yes	0.1	0	6+

* = states receive approximately 1/2 of this amount.

Total royalties collected from federal and Indian lands between 1975-80 was \$2,415.6 million (*supra*, note 1).

million, so far.⁷⁹ This amount is approximately 1.7 percent of royalties successfully collected from *onshore* federal and Indian lands during the last six years.⁸⁰ On a state-by-state basis, losses vary from approximately four percent to less than one percent each year.⁸¹

This approach can be criticized because significant detection and collection efforts have just begun. The data in Table 4 have been developed after two months of effort in some cases. It is tempting to speculate that more significant discoveries will be made. However, since most state audits have sought the worst cases, it is unlikely that the frequency of significant future discoveries will increase with continuing investigation. If the most serious losses have already been found, the figure obtained by this method may be a reasonable "order of magnitude" estimate of royalty losses as a whole.

Finally, since New Mexico is the only state that can completely review its accounts, its data provide a *measure* of royalty losses rather than an estimate. Since it is the second largest producer among the states, its measure may be indicative of national losses as a whole. New Mexico's revenue losses are less than 1.5 percent of its successfully collected royalties each year (Table 4).

Rescaling the Problem

Published data do not support the claims of royalty losses made in the press. A government tendency has been to use single examples as "evidence of substantial underpayments."⁸² When all of the data are compared, royalty losses are much less than usually claimed. On average, they are between 1–2 percent each year.

This conclusion does not ignore the fact that the Conservation Division's approach to royalty management has been flawed. It does not ignore that significant injuries are presently being incurred. It does, however, question whether large recoveries will be made by implementing proposed reforms. It suggests that benefits may be smaller than usually supposed, and, most importantly, that they may be nonexistent once impacts on the states, the Indian tribes, the DOI, and the public have been taken into account.

Impacts

In its final report, the Linowes Commission concludes that the government "must be held accountable for fulfilling a public trust [by] as-

79. DOI, *Interior Recovers \$42 Million in Royalty Underpayments; Audits Go On*, INSIDE ENERGY/WITH FEDERAL LANDS, 16 (Aug. 23, 1982) and interviews with state officials (Sept. 13–14, 1982).

80. *Supra* note 1. In most cases, records of the past six years have been reviewed. In some cases, reviews have gone back 10 years or more.

81. *Id.*

82. DOI, *supra* note 17, at 17.

sure that royalties are fully and fairly collected.⁸³ The industry [on the other hand] has the primary responsibility for the detailed record keeping needed to assure that all royalties are paid."⁸⁴ Pursuing this tack, the Commission makes 60 detailed recommendations to improve the nation's royalty management system.⁸⁵ Forty-seven bear directly upon the new Minerals Management Service and its internal controls and procedures. Thirteen have consequences for the states, the Indian tribes, and the oil and gas industry (Appendix 3). If implemented, these changes may improve the nation's minerals management system. The question is: at what cost and to whom?

THE DEPARTMENT OF THE INTERIOR

Two thousand personnel (mostly from the reorganized Conservation Division) are employed at the MMS,⁸⁶ which has an annual operating budget of \$248 million.⁸⁷ The Office of Royalty Management (ORM) in the MMS has an annual budget of \$15 million.⁸⁸ Twenty-six million dollars in supplementary funds were requested in 1982-83 to implement the Linowes Commission's recommendations.⁸⁹ Half of these funds will be used to install a new, computerized accounting and auditing system⁹⁰ which will upgrade royalty accounting⁹¹ and will be used to conduct "look-back" audits of the nation's 25 largest oil and gas companies.⁹²

Look-back audits are expected to cost \$5 million,⁹³ and providing on-line access to the new system for states and Indian tribes will cost \$1.2 million.⁹⁴ The remainder of the funds will be used to hire more royalty management staff, to increase salaries and benefits, and to provide new

83. *Id.* at xvii, 7, 44, and 85.

84. *Id.*

85. They include legislative and administrative initiatives that have structural, functional, and financial impacts on the DOI, on the states and Indian tribes, and on the oil and gas industry.

86. Interview with Robert E. Boldt, Associate Deputy Director, Royalty Management, MMS (Mar. 15, 1982).

87. *Id.*

88. Prior to reorganization of the Conservation Division, the ORM had an annual budget of \$6 million, Interview, *supra* note 86.

89. Interview, *supra* note 44.

90. *I.e.*, IRMP *supra* note 11, Interview, *supra* note 86, and testimony of Doyle G. Federik, Acting Director, USGS, before the Linowes Commission (August 28, 1981).

91. The new system (*i.e.*, the IRMP) has been criticized as being inefficient and ill conceived because it does not address the basic problems of federal royalty management, *i.e.*, sound data gathering and accounting practices. Its procurement has been questioned because estimates of royalty underpayments are alleged to be inaccurate and because it is alleged that the system is too expensive, see USGS, Applied Research & Development Dept. (J. Lohrenz), BACK TO SQUARE ZERO FOR THE 'IMPROVED ROYALTY MANAGEMENT PROGRAM' (1981).

92. DOI, *supra* note 17, at 79.

93. Interview, *supra* note 44.

94. DOI, *supra* note 17, at 129; this amount will recur annually.

training programs.⁹⁵ One-time ORM expenses for collecting old accounts and installing the new, computerized accounting system could reach \$25 million by 1983,⁹⁶ and recurring costs for staffing, benefits, training, and computer access for the states and tribes could reach \$23 million each year.⁹⁷

An emergency audit fund has been proposed which will use royalty payments to circumvent normal budgetary delays and to provide ready cash for rapid responses to royalty accounting problems.⁹⁸ The fund will be financed by taking one-half to one percent from gross royalty receipts before revenues are delivered to the Treasury or returned to the states and Indian tribes.⁹⁹ Approximately \$15–30 million could be diverted and spent by the ORM for emergency audits each year.¹⁰⁰

The Linowes Commission has proposed that the emergency audit fund be used to reimburse the states and Indian tribes for their cooperative or contracted services.¹⁰¹ The states and tribes have argued that the federal government should pay for its own royalty management responsibilities.¹⁰² They have indicated what the cost of their services might be. California, with net 1980 royalties of \$36.3 million, has said it could do the federal government's job within its borders for approximately \$1 million a year over the next four years.¹⁰³ New Mexico, with net 1980 royalties of \$108 million, has estimated that it could do the job within its borders for \$400,000 each year.¹⁰⁴ If we assume that California's assessment is accurate, payments to the states and tribes could reach \$39.5 million each year.¹⁰⁵

It is unlikely that all of these impacts will be simultaneously felt by the ORM. It is likely that the states and tribes will have to share expenses

95. Interview, *supra* note 44 and DOI, *supra* note 17, at 101–104.

96. Interview, *supra* note 44.

97. *I.e.*, the sum of the ORM's present annual budget (\$15 million) and \$8 million from the supplementary request which covers new hires, raises, training, etc.

98. DOI, *supra* note 17, at 132.

99. *Id.* at 133.

100. This is one-half to one percent of the \$2,904 million collected in royalties in 1980 (Table 1).

101. DOI, *supra* note 17, at 134–136. Cooperative or contracted services include royalty accounting, desk reviews, audits, and field inspections.

102. Testimony of state representatives before the Linowes Commission (1981) and personal communication with representatives of California, Colorado, Utah, New Mexico, and others (1982).

103. ABADIE, *supra* note 11, and California's proposed Assistance Agreement with the MMS, transmitted to Robert E. Boldt from Jean A. Abadie (May 21, 1982).

104. J. D. Ramsey, Director of New Mexico Oil Conservation Division, testimony before the Linowes Commission (September 23, 1981). New Mexico is the only state that can easily review federal royalty accounts.

105. California's proposal includes salary, benefits, travel, and overhead expenses for 23 new personnel. If we assume that a comparable per account, per well, or per net royalty dollar effort is required for all states who receive federal royalties, then the figure shown obtains.

with the MMS for some of the services they provide.¹⁰⁶ If so, one-time capital expenditures could be \$25 million for the ORM,¹⁰⁷ and annual expenditures could be \$38–53 million each year.¹⁰⁸ However, if the states' and tribes' outlook prevails (i.e., that the federal government should pay for the costs of royalty management), one-time capital expenditures for the ORM would be unchanged, but recurring annual expenditures could rise to \$62.5 million.¹⁰⁹

Legislative and litigation costs as a result of proposed reforms will also affect the DOI. Preparing testimony for congressional hearings, drafting legislation, lobbying Congress, and defending the Secretary's position against lawsuits can consume considerable resources. Six recommendations of the Linowes Commission require specific legislation.¹¹⁰ Three bills addressing the Commission's recommendations have already been introduced.¹¹¹ Questions have been raised that may impede their passage.¹¹²

Finally, reorganization of the Conservation Division has already had a significant impact on the DOI.¹¹³ Transfer of the approximately 1,200 geologists and engineers has caused serious personnel disruptions.¹¹⁴

106. Expenses would be shared either through reimbursement of the states' and tribes' own royalties as in the emergency audit fund, or by donated services as is now being done under existing cooperative agreements.

107. *I.e.*, for the new computer system, look-back audits, etc.

108. *I.e.*, the sum of the \$23 million recurring ORM costs and the \$15–30 million from the emergency audit fund.

109. *I.e.*, the sum of the \$23 million recurring ORM costs and the projected \$39.5 million state and Indian tribe recharge for services rendered.

110. DOI, *supra* note 17, at 172–174.

111. S-2305 and S-2764, 94th Cong., 2d Sess. (1982), and HR-5121, 97th Cong., 2d Sess. (1982).

112. For example, it has been questioned by the American Petroleum Institute (hereinafter cited as API) whether too much of the Secretary's authority will be diverted to career civil servants in the MMS as a result of proposed legislation (API in-house response to the Linowes Commission report, transmitted to the Secretary of the Interior, Feb. 16, 1982). Another point raised by the API is that extension of police powers to states and Indian tribes for oil field security may be too costly or unconstitutional on federal lands. Finally, the API has questioned whether reducing royalties to the states and Indian tribes through the emergency audit fund is legal.

States and tribes argue that the trust responsibility of the federal government extends to *full payment* for its *own* management activities on public and Indian lands. DOI, *supra* note 17, at 133–134 and interview with Jan Stevens, Deputy Attorney General of California, Feb. 19, 1982. Proposals to the contrary may impede passage of legislation.

113. When reorganization occurred, the entire Conservation Division (including its technical staff) was severed from the USGS and placed in the new MMS. 47 Fed. Reg. 4,751, *supra* note 20. The Commission had recommended that an Office of Royalty Management be created outside the USGS and that the USGS's applied engineering and geological staff be left behind. DOI, *supra* note 17, at 148–50.

114. Engineers and geologists now worry that their careers will be damaged since they are no longer affiliated with the prestigious USGS. They resent performing regulatory and bookkeeping functions when their professional training lies in scientific and technical areas. They are distraught because they can no longer aspire to top management positions which will now be filled by financial experts and certified public accountants (interviews were conducted with MMS geologists and engineers in January, February, and March, 1982).

Highly trained and experienced staff are now leaving the MMS,¹¹⁵ and the Commission's goal of attracting qualified accounting and royalty management personnel¹¹⁶ may be exactly offset by their departure.

THE STATES AND INDIAN TRIBES

The states and Indian tribes will suffer financially if the federal government's position on cost sharing (vis-à-vis the emergency audit fund) prevails. For example, California earned \$73.6 million in gross royalties in 1980.¹¹⁷ It could pay \$368,000 into the emergency audit fund each year. New Mexico, with gross royalties of \$216 million in 1980,¹¹⁸ could pay \$1.1 million into the emergency audit fund each year. Indian tribes, with gross royalties of \$164 million in 1980,¹¹⁹ could pay \$1.6 million into the emergency audit fund each year. Direct costs to the states and Indian tribes as a result of the emergency audit fund could exceed \$4.8 million each year.

Another problem with the emergency audit fund is that none of the monies collected for it are matched to the severity of problems which might occur. It is possible that a state or reservation paying a relatively large amount might require fewer emergency audits than one paying less. Also, revenues that are collected cannot be accumulated from year to year. All the monies must be spent each year whether or not serious problems occur. Thus, the MMS will be tempted to collect and spend the maximum to demonstrate its diligence against waste and fraud.

Indirect costs from the emergency audit fund may also occur. Twenty-five percent of all onshore federal royalties are credited to the Federal Reclamation Fund (FRF) each year (Appendix 1). This fund is earmarked by Congress for state reclamation projects.¹²⁰ In 1980, approximately \$156 million was deposited in the FRF for states' use.¹²¹ Implementation of the emergency audit fund could reduce allocations to the FRF.

Eighty percent of OCS royalties (or \$900 million, whichever comes first) is deposited in the Land and Water Conservation Fund (LWCF) each year.¹²² In 1980, approximately \$806 million was credited to the LWCF.¹²³ Roughly half of this amount was available to the states and Indian tribes for acquisition or development of recreational lands. If the emergency audit fund is implemented, allocations to the LWCF could be reduced.

115. *Id.*

116. DOI, *supra* note 17, at 148-50.

117. USGS, *supra* note 1.

118. *Id.*

119. DOI, *supra* note 17, at 6.

120. Interview with Robert Angle, Chief of Grants Administration, DOI, Western Region (Mar. 15, 1982).

121. DOI, *supra* note 17, appendix F, 6.

122. DOI, *supra* note 17, at 6.

123. *Id.* at appendix F-6.

Total indirect costs from reductions to the FRF and LWCF could exceed \$7 million each year.¹²⁴

A final indirect impact arises from cooperative agreements with the MMS. The Linowes Commission has recommended:

- that uniform accounting and reporting practices be developed among the states and tribes;
- that production, sales, tax, and other information be shared among the states and tribes, and between them and the federal government; and,
- that participation in security, enforcement, investigation, accounting, and auditing procedures be increased.¹²⁵

The Commission believes that management services should be provided through cooperative agreements.¹²⁶ Uniform procedures will increase costs to the states and tribes because accounting systems, computers, and laws are incompatible.¹²⁷ Enforcement and investigation costs will be increased by these proposals because officers will be given additional responsibilities or new personnel will have to be hired. Total direct and indirect costs to the states and tribes as a result of the emergency audit fund could surpass \$11.8 million each year.

THE INDUSTRY

Imposing new regulations on the oil and gas industry could benefit the public if impacts are minor, but could be detrimental if the impact of new regulations is severe. For example, if minor regulatory changes are made, corporate earnings could decline, but some income which was previously dispersed to stockholders would be transferred to the public through higher tax collections. This effect may have a net public benefit if the impact on earnings is small.

On the other hand, if the effect of new regulations is severe (as would be the case if significant underreporting were found), an overall reduction in oil and gas production could occur. Marginally producing wells would become submarginal and would be capped off. Since marginal wells just break even, stockholders would be less affected by their shutdown than the federal government would be. Royalties and tax flows would cease, and public losses would be the most severe. The scale of impacts would

124. *I.e.*, one-half to one percent of the amount normally allocated to the FRF and LWCF and subsequently available to the states and Indian tribes.

125. DOI, *supra* note 17, at 210–223.

126. This is because “it would not be appropriate for the Department [of the Interior] to relinquish [its] entire responsibility for collection, accounting, and auditing.” DOI, *supra* note 17, at 134–136.

127. There is a disincentive to alter software, hardware, and accounting practices. Cooperative legislation of legal practices between states, tribes, and the federal government may be impossible.

TABLE 5

Oil and gas lease-sale bonuses and royalty payments for the Outer Continental Shelf 1970-1980 (Outer Continental Statistics, June 1981, USGS).
(\$ in billions).

Year	Bonuses	Royalties
1970	\$ 0.94	\$0.28
1971	0.09	3.35
1972	2.25	0.36
1973	3.08	0.40
1974	5.02	0.56
1975	1.08	0.62
1976	2.24	0.70
1977	1.57	0.92
1978	1.77	1.15
1979	5.08	1.52
1980	3.45	2.14
1970-80 totals =	\$28.22	\$9.00

be determined by corporate investment patterns, asset holdings, and the liquidity of companies involved. In general, smaller companies may reach shutdown before large companies would.

Industry officials estimate that accounting and related costs will triple as a result of proposed reforms.¹²⁸ Some companies have already quadrupled their accounting and related staffs.¹²⁹

A second, and more important (i.e., greater financial), impact on the oil and gas industry (and subsequently on the public) occurs on undeveloped oil and gas reserves. Table 5 shows that the greatest source of government oil and gas revenue is from bonus payments on lease sales. In 1980, \$4.3 billion was collected from lease sales while only \$2.9 billion was collected from royalties. Bonuses have accounted for three times as much revenue as royalties in areas which contribute the most to domestic production (i.e., OCS tracts). As energy prices increase, and as decontrol of domestic oil and gas prices occurs, the value of petroleum reserves on federal and Indian lands will rise. Bonus bids for these assets will also increase, but a relationship between them and royalty payments ensures that a net gain in one area will result in a net loss in the other. This can be illustrated with a simple example.

Suppose that an oil field is expected to yield a \$1 million a year net return.¹³⁰ Also, suppose that the field lasts indefinitely and that the dis-

128. Interviews with several companies (Aug. 24, 1982).

129. *Id.*

130. This figure includes a normal rate of return on invested capital.

count rate is 10 percent. Finally, assume that investors must bid for development rights and that all bidders have access to similar information, i.e., bidding is competitive.¹³¹ Under these circumstances, bidders, recognizing an opportunity to collect "excess profits" from the field, will "bid up" bonus bids until a level is reached that reflects their expectation of excess future returns. The winning bid will be close to \$10 million, or the net present value of expected returns.¹³²

Now, for the sake of argument, assume that the \$1 million per year excess profit comes from underreporting, from fraud, or from defensible interpretations of reporting rules. Under these circumstances, bidders will capitalize their "windfall" into bonus bids for new fields since doing so will confer a competitive advantage in acquiring new assets. The mechanism for this behavior is identical to the case above, but in this example, the owner will recover royalties lost to underreporting through increased bonus bids. His net income will remain unchanged.

Finally, assume that the owner implements a new reporting, accounting, and auditing system to recover royalties lost to underreporting. If underreporting does occur, and if the new system successfully discovers it, excess profits will decline and royalty payments to the owner will increase. However, through a reversal of the mechanism described above, the amount capitalized into bonus bids by underreporting firms will be decreased by an amount exactly equal to the present value of lost excess returns.¹³³

Ironically, if the owner's new system successfully captures lost royalties, his revenues will be removed from one pocket (bonus bids) and put into another (royalty collections). No net increase from newly leased fields will occur, and, worse yet, the owner may suffer a net revenue loss if the cost of the new system was high.

This example illustrates that if significant underreporting is occurring on federal and Indian lands, any attempt to recover "old" oil and gas losses may be successful, but recoveries from "new" fields will be exactly offset by lower bonus bids. Bonus bids on new fields will be reduced immediately if underreporting is significant, but increases in royalty collections will occur only slowly over the lifetime of new fields.

131. In the case of federal and Indian lands, the DOI ensures that it is.

132. \$1 million in excess profits per year will be worth: $\$1 \text{ million} / 0.10 = \10 million in present-value terms. Bidders who anticipate capturing the "windfall" will be forced to bid against each other until the bid is \$10 million. At this point the net excess returns are zero since the investment opportunities foregone by paying the \$10 million have exactly cancelled the expected excess profits.

133. Likewise, if underreporting is impossible, bids on similar areas will be lowered by exactly \$10 million.

SUMMARY AND CONCLUSIONS

In this paper we argue that insufficient attention has been paid to the benefits and, more particularly, to the costs of reforming the nation's minerals management system. Recoverable underpayments from mismanagement, waste, theft, and fraud are usually overstated. The best evidence suggests that revenue losses are generally less than two percent of successfully collected royalties each year. The costs of proposed reforms have not previously been estimated. Direct increases in the DOI's outlays for improved royalty management could be between \$38–63 million each year. This is roughly one to two percent of successfully collected annual royalties. States and Indian tribes may pay approximately \$12 million each year for improved royalty management, and may incur other costs for uniform accounting, inspecting, and policing procedures. The industry has already incurred additional costs for accounting, record keeping, and compliance with new rules. Significant impacts could reduce national energy production. Net benefits of proposed management reforms are probably negative, and harm to the public welfare may occur.

Other impacts from present reform proposals are distributional. From a national perspective, they shift revenues *away* from the Treasury (by reducing bonus bids and by reducing royalties via the MMS's share of the emergency audit fund); *away* from the states and Indian tribes (by reducing their royalties through payments to the emergency-audit fund); *away* from the oil and gas industry (by increasing overhead costs and by reducing overall production); and *into* a new bureaucracy whose service may not be worth its cost.

On the other hand, *any* revenue losses are significant from a local perspective. States and Indian tribes deserve prompt, accurate, and complete payment of royalties. Current management reforms are derived from a national perspective. There is a tendency to swamp or ignore small local losses (e.g., \$5–10 million per year). A better approach to royalty management reform would recognize the importance of local losses and devise a cost-effective means of responding to them. This does not mean that all recoveries should be pursued at a net national loss. In general, efforts to collect mineral royalties should be balanced. If the costs of royalty management are borne along with its benefits, natural and obvious practices will obtain. At the minimum, this approach will begin with an objective assessment of the relative benefits and costs of royalty management reforms.

APPENDIX 1: Source and distribution of oil and gas revenues (rents, bonuses, and royalties) from federal and Indian lands.

- A. Outer Continental Shelf Production [enabled by OCS Lands Act of 1953; 43 USC 1331–1343, 1337(f)–(v) and 1338 (1976 & Supp. IV 1980)].**
1. Approximately 70% of rents, bonuses, and royalties go to the Land and Water Conservation Fund each year until \$900 million has been reached. Approximately half of this fund is shared with the states and Indians for the purchase, improvement, or maintenance of recreational areas.
 2. Approximately 10% is dispersed to each of the following: Historic Preservation Fund, on-site contingency fund, and the U.S. Treasury General Fund.
- B. Public Lands (enabled by the Minerals Leasing Act of 1920, as amended; 30 USC 181–287 (1976 & Supp. IV 1981)).**
1. States, except Alaska, receive 50% of all revenues generated within their jurisdiction; Alaska receives 90%.
 2. 40% collected within states, except Alaska, goes to the Federal Reclamation Fund which is subsequently dispersed by Congress for state reclamation projects.
 3. 10% collected within states goes to the U.S. Treasury General Fund.
- C. Acquired Lands (enabled by the Mineral Leasing Act for Acquired Lands of 1947: 30 USC 351–359 (1976 & Supp. IV 1981)).**
1. States (or counties, depending on whether the acquired land lies within a National Forest or a National Grassland) receive 25% of all revenues generated within their jurisdiction;
 2. 10% goes for roads, trails, and forests;
 3. 65% goes to the U.S. Treasury General Fund.
- D. Indian Lands [enabled by 30 USC 181–287 (1976 & Supp. IV 1981)].**
1. 100% of all revenues and royalties generated on Indian lands are returned to the Indian tribes or allottees.

APPENDIX 2: Reports published by the General Accounting Office and the Office of the Inspector General criticizing oil and gas royalty management over the past thirty years.

Office of Management and Budget (GAO), “Review of Supervision of Oil and Gas Operations and Production on Government and Indian Lands” (Dec. 1959).

Office of Management and Budget (GAO), “Certain Deficiencies in Financial Management of Oil and Gas Activities” (Aug. 1964).

- Office of Management and Budget (GAO), "More Specific Policies and Procedures Needed for Determining Royalties on Oil From Leased Federal Lands" (Feb. 1972).
- Office of Management and Budget (GAO), "Coal, Oil, and Gas: Better Management Can Improve Development and Increase Indian Income and Employment" (March 1976).
- Office of Management and Budget (GAO), "Oil and Gas Royalty Collections—Serious Financial Management Problems Need Congressional Attention" (Apr. 1979).
- Office of Management and Budget (GAO), "Oil and Gas Royalty Collections—Longstanding Problems Costing Millions" (Oct. 1981).
- Department of the Interior (Office of the Inspector General), "Review of Oil and Gas Lease Revenue" (Feb. 1969).
- Department of the Interior (Office of the Inspector General), "Review of Royalty Accounting System for Onshore Oil and Gas Leases" (June 1975).
- Department of the Interior (Office of the Inspector General), "USGS Royalty Accounting System Study of Solid Minerals Leasing Activities" (Aug. 1975).
- Department of the Interior (Office of the Inspector General), "Pilot Verification of Production Data" (Feb. 1977).
- Department of the Interior (Office of the Inspector General), "Review of Royalty Determination, Accounting, and Collection Activities for Gulf of Mexico OCS Oil and Gas Leases" (June 1977).

APPENDIX 3: Linowes Commission recommendations that affect the states, the Indian tribes, and the oil and gas industry.

Description of Recommendation	Focus and Extent of Impact
Require lessees to develop a royalty-payer plan that identifies payers and when they change.	Imposes bookkeeping and legal costs on lessees beyond their individual responsibilities
Establish an operator of record for each lease who would be responsible for all production and royalty records.	Same as above, but raises possible anti-trust violation problems.
Seek legislation requiring buyers to furnish purchase records to royalty managers (currently, only sellers must furnish sales records).	Imposes bookkeeping and reporting costs on transporters and refiners, especially since reports must follow a format prescribed by royalty managers.
Develop and issue guidelines for allowable product valuation, especially for natural gas.	If rules do not allow for special cases (as has happened in the past), could create additional confusion.

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| Conduct look-back audits on the 25 largest companies in the industry that account for 85% of all royalty payments. | Imposes litigation costs on the industry in the case of disputes; present government figures are so inaccurate that no conclusion about historical accounts is possible. |
| Revise federal site security standards and require lessees to develop site security plans that meet federal standards. | Imposes requirements beyond those that companies feel are sufficient to meet their security needs. |
| Seek cooperative agreement with states and Indian tribes to improve law enforcement on sites. | Imposes additional costs on states and tribes for law enforcement duties. |
| Seek cooperative agreements with states and Indian tribes to improve site inspections, audits, and royalty accounting. | Transfers responsibility of "public trust" from the federal government to the states and tribes at a substantial cost. |
| Hire and train new inspectors, and increase the number and frequency of site inspections for royalty accounting purposes. | Reduces number of personnel and the amount of effort expended on safety and environmental inspections. |
| Seek legislation imposing civil penalties for non-payment, late payment, and error ridden reports; federal shut-in and lease cancellation authority should be used for non-compliance. | Delegates discretionary authority to civil servants, creates problems with due process, and could impose litigative costs on the industry. |
| Create a self-sustaining emergency-audit fund to deal with reporting problems that arise outside the normal audit schedule. | Imposes constant royalty losses of 1/2–1% each year on states and Indian tribes regardless of the severity of problems on particular lands. |
| Seek changes in IRS rules to shift windfall profits tax calculations from the MMS to the industry. | Imposes 50 staff-years of effort to the industry each year; since ~50% of all royalties are paid "in kind," the problem is made worse. |
| Increase all noncompetitive royalty rates from 12 1/2% to 16 2/3% to standardize the rate base. | Increases royalty payments to the industry and may eliminate production from marginal wells. |