Scientific Inventory of Onshore Federal Lands' Oil and Gas Resources and Reserves and the Extent and Nature of Restrictions or Impediments to Their Development

THE PARADOX/SAN JUAN, UINTA/PICEANCE, GREATER GREEN RIVER, AND POWDER RIVER BASINS AND THE MONTANA THRUST BELT

IN COMPLIANCE WITH THE ENERGY POLICY AND CONSERVATION ACT AMENDMENTS OF 2000, P.L. 106-469 §604

Prepared by the

U.S. Departments of the Interior, Agriculture and Energy

January 2003

BLM/WO/GI-03/002+3100

JANUARY 2003

The mention of trade names or commercial products does not constitute endorsement or recommendation for use by the Federal Government.

THIS DOCUMENT AND SUPPORTING DATA CAN BE FOUND AT

WWW.DOI.GOV

AND

WWW.BLM.GOV

Compact disks (CDs) are available from the Bureau of Land Management

AUTHORS AND CONTRIBUTORS

Childs Cantey, Advanced Resources International, Inc.
Ronald R. Charpentier, DOI-U.S. Geological Survey
Christie M. Chester, Gonzales Consulting Services, Inc.
W. Dean Crandell,* USDA, Forest Service
Melissa Dover, Premier Data Services, Inc.
Jeffrey Eppink, Advanced Resources International, Inc.
William Gewecke, DOI-Bureau of Land Management
Veronica Guandique, Advanced Resources International, Inc
H. William Hochheiser,* DOE
Brian Keightley, Advanced Resources International, Inc.
Timothy R. Klett, DOI-U.S. Geological Survey
Bob Johnson, Premier Data Services, Inc.
Keith Lewis, Premier Data Services, Inc.
Sam Limerick, Z, Inc.
Gary R. Long, DOE-Energy Information Administration
Xin (Lucy) Luo, Z, Inc.
Roy Lynch, Advanced Resources International, Inc.
Michael Marquis, Advanced Resources International, Inc.
David F. Morehouse,* DOE-Energy Information Administration
Jack Perrin, Z, Inc.
Brenda Pierce,* DOI-U.S. Geological Survey
Frances Pierce,* DOI-U.S. Geological Survey
Dan Rabinowitz, DOI-Bureau of Land Management
Christopher J. Schenk, DOI-U.S. Geological Survey
Richard L. Watson,** DOI-Bureau of Land Management
Suzanne Weedman,* DOI-U.S.Geological Survey
Ron White, Premier Data Services, Inc.
Robert Woerner, DOI-Bureau of Land Management
John H. Wood, DOE-Energy Information Administration

*Interagency Steering Committee Member
**Interagency Steering Committee Chairman

TABLE OF CONTENTS

APPENDICES

FIGURES

EXECUTIVE SUMMARY

SECTION 1.0 – INTRODUCTION

SECTION 2.0 – METHODOLOGY

SECTION 3.0 – RESULTS

TABLES

EXECUTIVE SUMMARY

THE MANDATE FROM CONGRESS

In November 2000, Congress passed and President Clinton signed the Energy Policy and Conservation Act Amendments of 2000 (EPCA) which directed the Secretary of the Interior, in consultation with the Secretaries of Agriculture and Energy, to conduct an inventory of oil and natural gas resources beneath Federal lands.

> "The inventory shall identify: 1) the United States Geological Survey reserve estimates of oil and gas resources underlying these lands; and 2) the extent and nature of any restrictions or impediments to the development of such resources."

This act marks the first time that Congress asked the Department to conduct a study of restrictions.

On October 11, 2001, Congress provided its sense of priority for this study:

> "...In light of recent attacks on the United States that have underscored the potential for disruptions to America's energy supply, the managers believe this project should be considered a top priority for the Department."

This report is a portion of the inventory of public oil and gas resources requested by Congress. This inventory is a comprehensive review of federal oil and gas resources and constraints on their development in five basins in the Interior West (Figure ES-1). These basins contain most of the onshore natural gas and much of the oil under Federal ownership within the 48 contiguous states. The EPCA requires that all onshore Federal lands be inventoried. The inventory will be expanded to include additional Federal lands and resources in the future.

For the federal public-land managing agencies, principally the Department of the Interior's Bureau of Land Management (BLM) and the Department of Agriculture's Forest Service (USFS) and the citizens they serve, this inventory will serve primarily as a planning tool. It provides public-land managers with additional information to help them develop management plans for the lands under their jurisdiction. It allows them to identify areas of high oil or gas potential and to evaluate the effectiveness of available stipulations in balancing the responsible development of those resources with the protection of other valuable resources in the area. Conversely, it also allows resource managers to identify areas of low oil and gas potential but high potential for other resources (e.g. wildlife) or uses (e.g. recreation). In these situations, resource managers and the public can consider applying land management strategies that may promote increased protection of valuable resources or promotion of uses that might ordinarily conflict with oil or gas development. This report is a critical step in evaluating whether existing rules are appropriate, or need to be changed, either to provide greater protection to the environment or to promote appropriate resource development.

THE PRESIDENT'S NATIONAL ENERGY POLICY DIRECTIVES

In May 2001, President Bush's National Energy Policy directed that the EPCA inventory be expedited and that constraints to federal oil and gas leasing be reassessed and modified "where opportunities exist (consistent with the law, good environmental practice, and balanced use of other resources)." The National Energy Policy further directed that any reassessment of constraints be conducted "with full public consultation, especially with people in the region." This inventory provides information regarding the geographical relationship between oil and gas resources and reserves and the constraints that govern their development. It is not a reassessment of any stipulations on the development of oil and gas resources. The public's opportunity to participate in any reassessment of restrictions on oil and gas activities will occur in public-land planning or legislative processes. This inventory provides some basic information for any such processes. Additional information may be available from monitoring and scientific studies incorporated into adaptive management processes.

The National Energy Policy provides an overview of the U.S. energy situation and alternatives available to increase energy efficiency and conservation, increase energy supplies, and protect the environment. At the direction of Congress, the present study focuses on the traditional energy resources of oil and natural gas beneath Federal lands[*].

This inventory was prepared by staff of the Department of the Interior's BLM and United States Geological Survey (USGS); the USFS; the Department of Energy (DOE); and the Energy Information Agency (EIA). The USGS provided the assessment of undiscovered, technically recoverable oil and natural gas resources beneath Federal lands based on commercially available data. The EIA contributed the analysis of proved reserves for Federal lands. The EIA data incorporates economic considerations not included in the USGS resource assessment. The DOE provided technical expertise to guide the design and analysis process for the inventory. The BLM and the USFS contributed their land-use planning information regarding oil and natural gas availability and leasing stipulations for the lands under their respective jurisdictions.

METHODOLOGY

This inventory is based on information that has been previously developed through both the scientific and planning processes of the contributing federal agencies. This information has often been provided to the public for its review and use. The information used in the present study is the best commercial and scientific information available. It has been compiled and analyzed by experts from the contributing agencies. The analytical methods and protocols used in the supporting studies have been subjected to rigorous review. The present study necessarily incorporates the assumptions, conditions, and limitations of the supporting scientific information as discussed in this report. This inventory is significant because for the first time information about oil and gas resources and reserves is overlain in a comprehensive manner with information about constraints on their recovery.

---

[*]In recognition of the increased emphasis on the development of alternative energy resources in the National Energy Policy, the Department of Energy, in coordination with the Department of the Interior, is releasing a report, analogous to the present report, on the potential of particular federal lands to support alternative energy technologies such as wind, solar and biomass.

A steering committee of the participating agencies identified five major geologic basins within the Interior West as priority geographic areas to inventory. The five basins are the Paradox/San Juan Basins in Colorado, Utah and New Mexico; the Uinta/Piceance Basins in Colorado and Utah; the Greater Green River Basin in Wyoming, Colorado and Utah; the Powder River Basin in Montana and Wyoming; and the Montana Thrust Belt in Montana.

These basins were selected for the inventory for several reasons. First, these basins encompass nearly 104 million acres. About 59 million acres in this area are under federal management. This acreage includes split estate lands in which private surface lands are underlain by federal subsurface mineral rights. Second, these basins contain most of the onshore natural gas and much of the oil under public ownership within the 48 contiguous states. Third, the population of the Interior West is growing rapidly. Public lands in this region face increased demands for their use as sites for recreation, livestock grazing, forestry, open space, wildlife habitat, mining, and oil and gas production.

The analysis of constraints to development centered on two factors that affect access to oil and gas resources on Federal lands. Those factors are (1) whether the lands are "open" or "closed" to leasing, and (2) the degree of access afforded by lease stipulations on "open" lands. All oil and gas leases have statutory and regulatory requirements. These stipulations can have many purposes ranging from the protection of environmental, social, historical, or cultural resources or values to the payment of rentals and royalties.

Approximately 1,000 different lease stipulations are being applied by the land managing agencies in the five basins studied. To focus the analysis of constraints on oil and gas development, the inventory evaluated the extent of public lands (1) in which leasing is permitted under standard stipulations, and (2) in which leasing is permitted with increasing limitations on access, principally seasonal occupancy restrictions, and (3) in which oil and gas leasing is prohibited. The analysis also included consideration of exceptions to stipulations granted after a review of on-the-ground conditions and the use of modern technologies such as directional drilling. The ten categories of restrictions analyzed in this report include the complete range of access restrictions associated with oil and gas leasing in the five basins.

CONCLUSIONS

While the results of this analysis are different for each of the five basins studied, the cumulative results for all of the basins (Figure ES-2) can be summarized as follows (Federal lands, including split estate, in the five basins total 59,416,000 acres).

1. Approximately 39 percent (23,091,000 acres) of the Federal land in these basins is available for oil and gas leasing with standard stipulations (Figure ES-2, "Leasing, Standard Lease Terms"). Based on resource estimates, these lands contain 57 percent of the technically recoverable oil and 63 percent of the technically recoverable gas in the basins.

2. Approximately 25 percent (15,152,000 acres) of the Federal land is available for leasing with restrictions on oil and gas operations beyond standard stipulations (Figure ES-2, All other "Leasing" categories except "Leasing, Standard Lease Terms"). Based

on resource estimates, these lands contain 28 percent of the technically recoverable oil and 25 percent of the technically recoverable gas in the basins.

3. Approximately 36 percent (21,173,000 acres) of the Federal land in the five basins is not available for leasing (Figure ES-2, 3 "No Leasing" categories). Based on resource estimates, these lands contain about 15 percent of the technically recoverable oil and 12 percent of the technically recoverable natural gas in the basins.

COMPLIANCE WITH THE LAW

All oil and gas leases on Federal land, even those with the least restrictive stipulations, are subject to full compliance with all substantive and procedural environmental laws and regulations. These laws include the National Environmental Policy Act, Clean Water Act, Clean Air Act, Endangered Species Act, and the National Historic Preservation Act. While compliance with these laws may delay, modify, or prohibit oil and gas activities, these laws represent the values and bounds Congress believed appropriate to place on Federal land managers for their stewardship of Federal lands. The present study was conducted at the request of Congress to provide information for it to consider in forthcoming deliberations on the role of Federal lands in the U.S. energy situation.

It is important to emphasize that this inventory was prepared at the direction of Congress. It is not a decisionmaking document. The inventory identifies areas of high and low oil and gas potential and the nature of constraints to the development of those resources in five basins in the Interior West. Any reassessment of these restrictions on oil and gas activities will occur in public-land use planning or the legislative process, both of which are fully open to public participation and debate over the appropriate balance between resource protection and resource development.

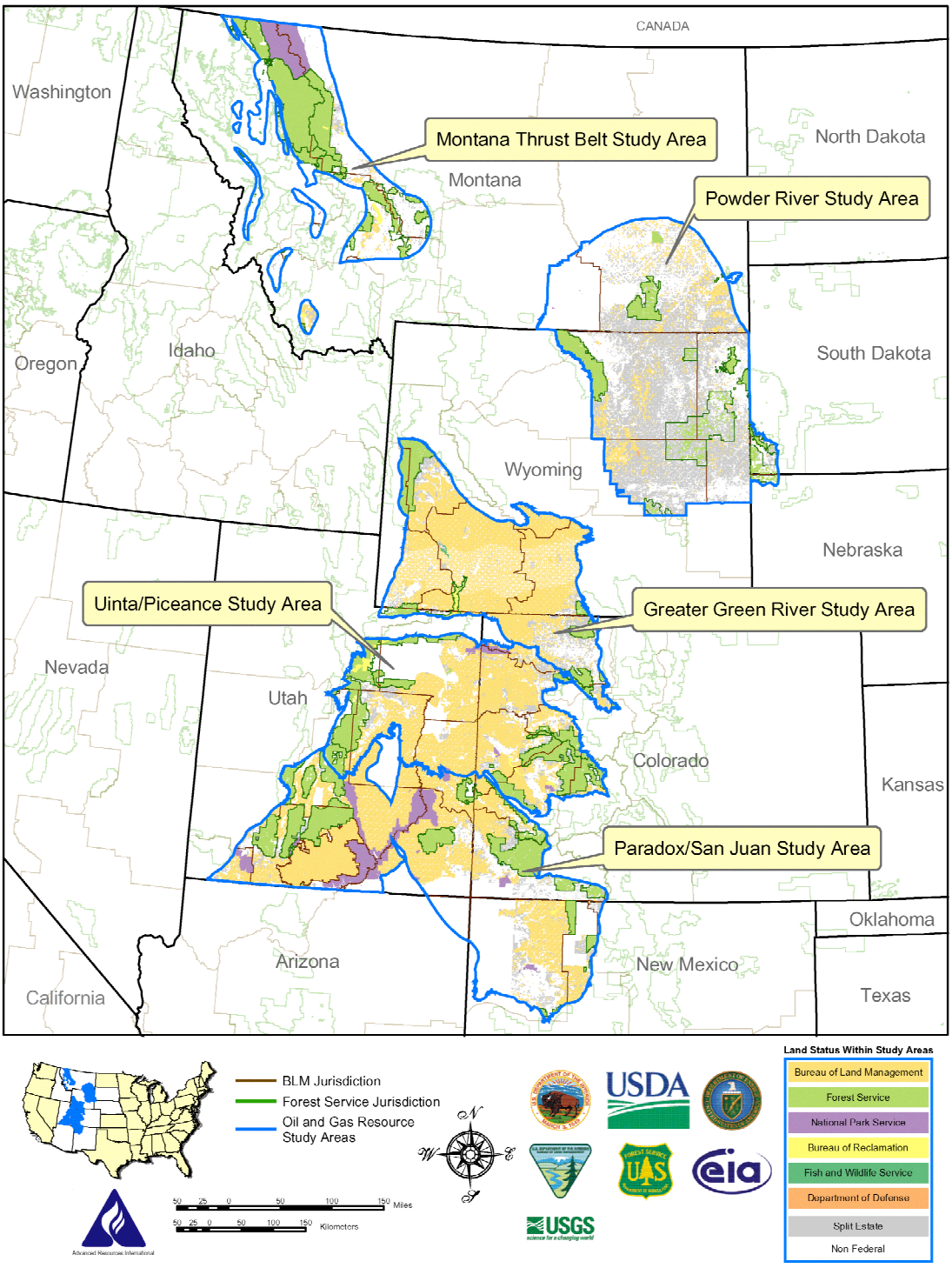

Figure ES-1 Outline of Study Areas Showing Federal Land Status

More Constrained

Less Constrained

	Access Category	Area (acres x1000)	Area Percent of Federal	Resources Total Liquids* (MMBbl)***	Total Liquids* Percent of Federal	Total Natural Gas** (Bcf)****	Total Natural Gas** Percent of Federal
1.	No Leasing (Statutory/Executive Order), (NLS)	10,068	16.9%	298	7.7%	9,035	6.5%
2.	No Leasing (Administrative), (NLA/LUP)	6,007	10.1%	116	3.0%	3,690	2.7%
3.	No Leasing (Administrative), (NLA)	5,098	8.6%	182	4.7%	3,185	2.3%
4.	Leasing, No Surface Occupancy (NSO)	2,714	4.6%	50	1.3%	3,120	2.3%
5.	Leasing, Cumulative Timing Limitations on Drilling >9 Months (TLs >9)	25	0.0%	3	0.1%	114	0.1%
6.	Leasing, Cumulative Timing Limitations on Drilling 6-9 Months (TLs 6-9)	2,521	4.2%	250	6.5%	5,549	4.0%
7.	Leasing, Cumulative Timing Limitations on Drilling 3-6 Months (TLs 3-6)	5,442	9.2%	528	13.7%	20,401	14.7%
8.	Leasing, Cumulative Timing Limitations on Drilling <3 Months (TLs <3)	697	1.2%	8	0.2%	733	0.5%
9.	Leasing, Controlled Surface Use (CSU)	3,753	6.3%	221	5.7%	6,080	4.4%
10.	Leasing, Standard Lease Terms (SLTs)	23,091	38.9%	2,198	57.0%	86,566	62.5%
	Total, Federal Lands Including Split Estate	59,416	100.0%	3,854	100.0%	138,472	100.0%
	Total Non-Federal	44,256		2,455		87,668	
	Total Study Area	103,672		6,309		226,141	

* Comprising oil, NGLs and liquids associated with natural gas reservoirs
** Comprising associated dissolved and nonassociated natural gas
***MMBbl -- Millions of Barrels
****Bcf -- Billion cubic feet
Small rounding errors may be present

Table ES-1 Summary of All EPCA Inventory Areas – Oil and Natural Gas Resources Affected by Access Categories

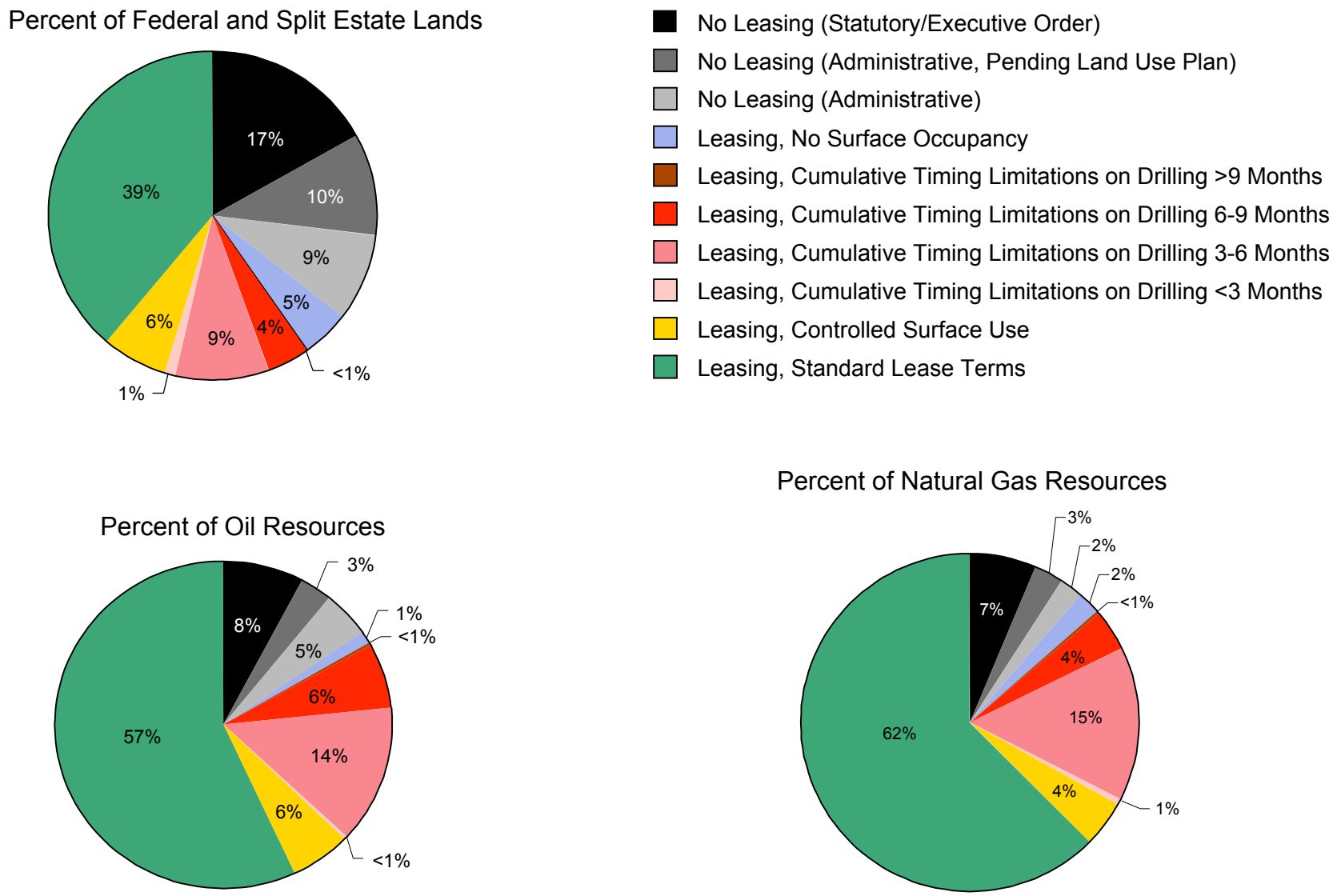

Figure ES-2 Summary of All EPCA Inventory Areas – Oil and Natural Gas Resources Affected by Access Categories