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

2006

Phase II Cumulative Inventory:

Northern Alaska

Montana Thrust Belt

Powder River Basin

Wyoming Thrust Belt

Greater Green River Basin

Denver Basin

Uinta-Piceance Basin

Paradox/San Juan Basins

Appalachian Basin

Black Warrior Basin

Florida Peninsula

USGS science for a changing world

In Compliance with the Energy Act of 2000, P. L. 106-469 § 604 as Amended by the Energy Policy Act of 2005, P. L. 109-58 § 364

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

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Executive Summary

The Mandate From Congress

In November 2000, Congress passed and President Clinton signed the Energy Act of 2000 (also referred to as the Energy Policy and Conservation Act [EPCA]). The Act 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 onshore Federal lands:[1]

The inventory shall identify:

1) the United States Geological Survey estimates of oil and gas resources underlying these lands;

2) the extent and nature of any restrictions or impediments to the development of the resources, including:

   (A) impediments to the timely granting of leases;

   (B) post-lease restrictions, impediments, or delays on development for conditions of approval, applications for permits to drill, or processing of environmental permits…

The EPCA marked the first time that Congress asked the Department of the Interior 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.

In August 2005, Congress passed and President Bush signed the Energy Policy Act of 2005 (EPAct 2005). Section 364 of this Act amends the inventory requirements of EPCA.[2]

This release presents a large majority of the inventory of public oil and gas resources requested by Congress. The EPCA Phase II inventory is a comprehensive review of Federal oil and gas resources and constraints on their development within 11 geologic provinces across the United States. It is cumulative in that it incorporates the Phase I areas (geologic provinces of the Interior West). Further, it represents an expansion of the inventory to include previously unstudied areas in the Interior West, Northern Alaska and several Eastern basins (Figure ES-1).

The EPCA requires that all onshore Federal lands be inventoried. Areas addressed in the Phase II inventory contain approximately 76 percent of the onshore natural gas and oil under Federal ownership. The inventory will be expanded in the future to include all Federal lands and resources.

For the Federal agencies that manage public land (principally the Department of the Interior's Bureau of Land Management [BLM] and the U.S. Department of Agriculture's Forest Service [USDA-FS])

[1] Federal lands are defined as not including Indian lands.

[2] EPAct 2005 amends the inventory requirements at 42 USC 6217. The updates have been reflected in the text of this document.

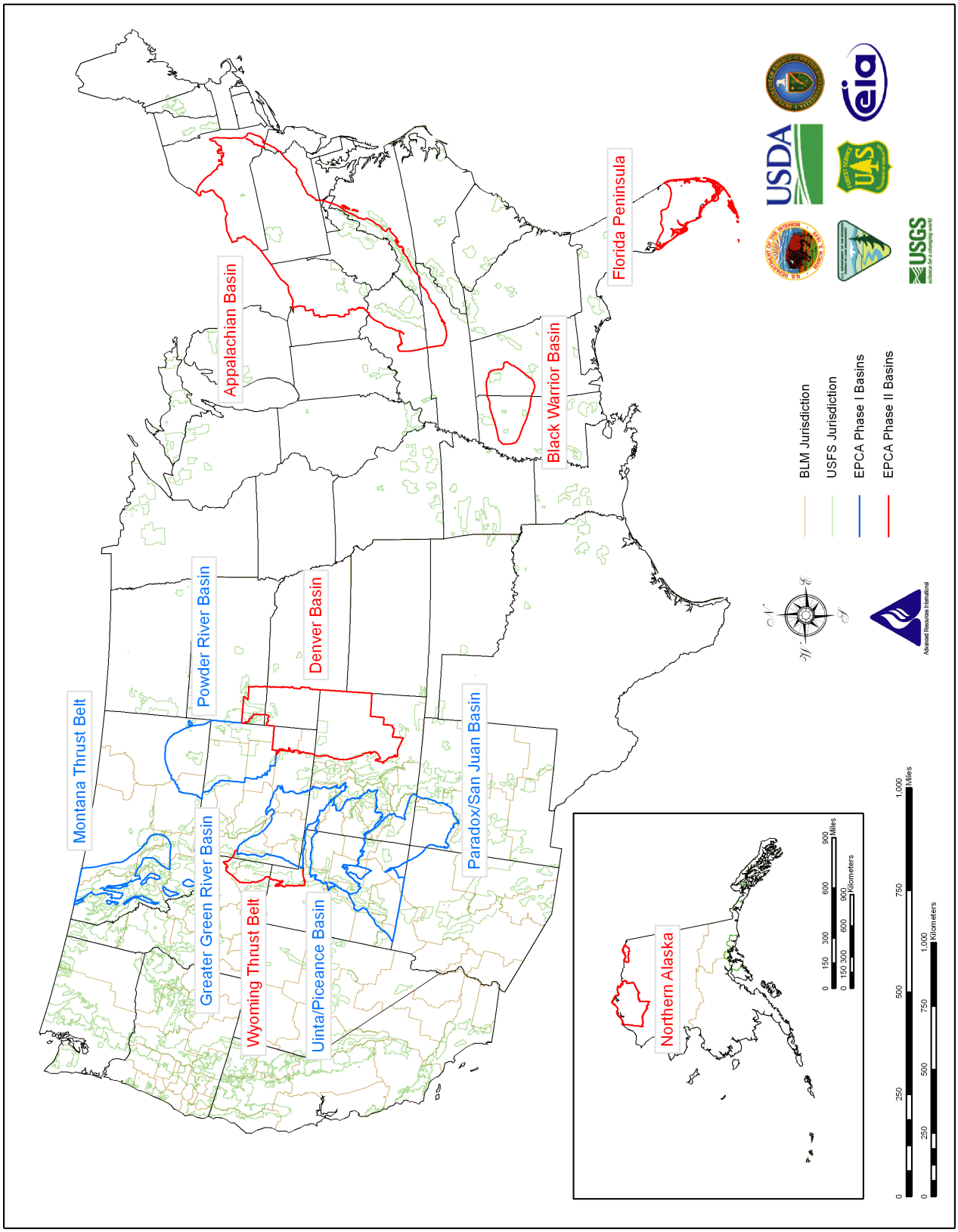

Figure ES-1. Study Area Locations

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 enables them to identify areas of high oil or gas potential and to evaluate the effectiveness of mitigating stipulations and conditions of approval in balancing the responsible development of those resources with the protection of other valuable resources in the area. The inventory also allows resource managers to identify areas of low oil and gas potential, but high potential for other resources (e.g., wildlife habitat) or uses (e.g., recreation). In these situations, resource managers and oil and gas operators can consider applying land management strategies that promote increased protection of other valuable resources or uses that might ordinarily conflict with oil or gas development. This report is a critical step in evaluating whether the documented impediments and restrictions are appropriate, or are unnecessarily interfering with oil and gas 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 the constraints that govern their development. It is not a reassessment of any stipulations or conditions of approval on the development of oil and gas resources. The public's opportunity to participate in any change of restrictions on oil and gas activities will occur during the land use planning or legislative process. This inventory provides some basic information for any such process. 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.[3]

This inventory was prepared under the lead of the Bureau of Land Management. Senior professionals from the Department of the Interior's BLM and United States Geological Survey (USGS), the USDA-FS; the Department of Energy (DOE)-Office of Fossil Energy, and the Energy Information Administration (EIA) were the major contributors. 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 reserves growth

[3] 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, has released a report, analogous to the present report, on the potential of Federal lands to support alternative energy technologies such as wind, solar, and biomass. See ***http://www.nrel.gov/docs/fy03osti/33530.pdf***

and proved reserves for Federal lands. The DOE provided technical expertise to guide the design and analysis process for the inventory. Field offices of the BLM and the USDA-FS 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 the scientific and planning processes of the contributing Federal agencies. This information has in large part been provided to the public for its review and use and is the best that is commercially and scientifically 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 it builds upon the process established in the EPCA Phase I inventory. It examines oil and gas (undiscovered technically recoverable resources and reserves growth) in context with information about constraints on their development.

The Phase II inventory examines six geologic provinces in addition to the five areas examined within the Interior West in the Phase I inventory. These six provinces are Northern Alaska (the National Petroleum Reserve in Alaska [NPR-A] and the Arctic National Wildlife Refuge [ANWR] Section 1002 only); the Wyoming Thrust Belt in Wyoming, Utah, and Idaho; the Denver Basin in Colorado, Wyoming, Nebraska, and South Dakota; the Florida Peninsula; the Black Warrior Basin in Mississippi and Alabama; and the Appalachian Basin in Tennessee, Kentucky, West Virginia, Virginia, Maryland, Ohio, Pennsylvania, New Jersey, and New York. These areas were selected for Phase II of the inventory because, as a group, they include Alaska, a state containing important oil and gas resources, and contain a large portion of the inventoried onshore Federal oil and gas resources in the lower-48 states relative to the EPCA Phase I study areas. In addition, especially in the West, the Federal lands within these areas are becoming increasingly important for recreation, livestock grazing, open space, wildlife habitat, cultural resources, and mining, as well as oil and gas and other energy production.

The Phase II inventory encompasses 295 million acres, of which about 99 million acres are under Federal management. This acreage includes split estate lands where private surface lands are underlain by Federal mineral rights.

This analysis of constraints to development centers on two factors that affect access to oil and gas resources on Federal lands. These factors are (1) whether the lands are “open” or “closed” to leasing, and (2) the degree of access afforded by lease stipulations and other conditions on “open” lands (some leasable lands may in effect be “closed” if no drilling can occur). All oil and gas leases are subject to a baseline level of constraint governed by statutory and regulatory requirements. These stipulations serve many purposes, ranging from the protection of environmental, social, historical, or cultural resources or values to the payment of rentals and royalties.

The Phase II inventory finds that approximately 2,130 individual lease stipulations are being applied by the land managing agencies in the areas analyzed. To focus the analysis of constraints on oil and gas development, the inventory evaluates the onshore Federal lands: (1) where leasing is permitted under standard stipulations; (2) where leasing is permitted with varying limitations on access, principally seasonal occupancy restrictions; and (3) where oil and gas leasing is precluded or prohibited. The inventory also considers exceptions to stipulations that are granted after a review of on-the-ground conditions and the use of modern technologies such as directional drilling. The impact of conditions of approval (COAs) attached to Federal drilling permits is also analyzed, which gives a more complete assessment of access constraints. A total of 175 unique COAs were identified and their effects on development evaluated. The nine categories of constraints analyzed in this report include the complete range of access restrictions associated with oil and gas leasing.

Results

The results of this cumulative Phase II inventory are unique for each of the eleven areas examined. The aggregate results for all of the areas (Table ES-1, Figure ES-2, and Figure ES-3) are summarized below.

- Total Federal lands, including split estate, total 99.2 million acres.
- Undeveloped oil resources under these Federal lands total 21.2 billion barrels, comprising 20.6 billion barrels of undiscovered technically recoverable resources and 593 million barrels of reserves growth.
- Undeveloped gas resources under these Federal lands total 186.9 trillion cubic feet, comprising 181.9 trillion cubic feet of undiscovered technically recoverable resources and 4.98 trillion cubic feet of reserves growth.
- Total proved reserves under these Federal lands total 444 million barrels of oil and 26.3 trillion cubic feet of natural gas.
- Approximately 24 percent of the Federal land in these areas (23.8 million acres) is accessible under standard lease terms. Based on resource estimates, these lands contain 3 percent of the oil (743 million barrels) and 13 percent of the gas (25.2 trillion cubic feet).
- Approximately 30 percent (30.0 million acres) of the Federal land is accessible with restrictions on oil and gas operations beyond standard stipulations. Based on resource estimates, these lands contain 46 percent of the oil (9.7 billion barrels) and 60 percent of the gas (111.5 trillion cubic feet).
- Approximately 46 percent (45.5 million acres) of the Federal land is inaccessible. Based on resource estimates, these lands contain about 51 percent of the oil (10.8 billion barrels) and 27 percent of the natural gas (50.1 trillion cubic feet).

Table ES-1. Summary of All EPCA Inventory Areas–Total Federal Land and Oil and Natural Gas Resources by Access Category

Access Category			Area		Resources[a]			
					Total Oil[b]		Total Gas[c]	
			(acres x 1000)	Percent of Federal	(MMbbls)[d]	Percent of Federal	(BCF)[e]	Percent of Federal
More Constrained ↑ Less Constrained	1.	No Leasing (Statutory/Executive Order) (NLS)	12,601	12.7%	7,510	35.4%	14,867	8.0%
	2.	No Leasing (Administrative) (NLA)	4,161	4.2%	1,405	6.6%	6,891	3.7%
	3.	No Leasing (Administrative) Pending Land Use Planning or NEPA Compliance (NLA/LUP)	19,680	19.8%	1,727	8.1%	25,444	13.6%
	4.	Leasing, No Surface Occupancy (NSO) (Net NSO for O&G Resources)	9,025	9.1%	135	0.6%	2,923	1.6%
	5.	Leasing, Cumulative Timing Limitations (TLs) of >9 Months	88	0.1%	3	0.0%	14	0.0%
	6.	Leasing, Cumulative Timing Limitations (TLs) of >6 to ≤9 Months	12,252	12.4%	7,059	33.3%	37,893	20.3%
	7.	Leasing, Cumulative Timing Limitations (TLs) of >3 to ≤6 Months	9,271	9.3%	1,184	5.6%	31,188	16.7%
	8.	Leasing, Controlled Surface Use (CSU)[f]	8,374	8.4%	1,451	6.8%	42,428	22.7%
	9.	Leasing, Standard Lease Terms (SLTs)	23,751	23.9%	743	3.5%	25,210	13.5%
Total, Federal Lands including Split Estate			**99,203**	100%	**21,216**	100%	**186,857**	100%
Total Non-Federal			**196,204**		**4,802**		**156,603**	
Total Inventory Area			**295,406**		**26,018**		**343,460**	

Summary						
Inaccessible (Categories 1-4)	45,467	46%	10,776	51%	50,125	27%
Accessible with Restrictions (Categories 5-8)	29,985	30%	9,697	46%	111,522	60%
Accessible under Standard Lease Terms (Category 9)	23,751	24%	743	3%	25,210	13%
Total, Federal Lands Including Split Estate	**99,203**	**100%**	**21,216**	**100%**	**186,857**	**100%**

Small rounding errors may be present.

[a] Undiscovered technically recoverable resources and reserves growth

[b] Including oil, natural gas liquids (NGLs) and liquids associated with natural gas reservoirs

[c] Including associated dissolved and nonassociated natural gas

[d] Million barrels [e] Billion cubic feet [f] Includes Cumulative Timing Limitations of ≤3 months

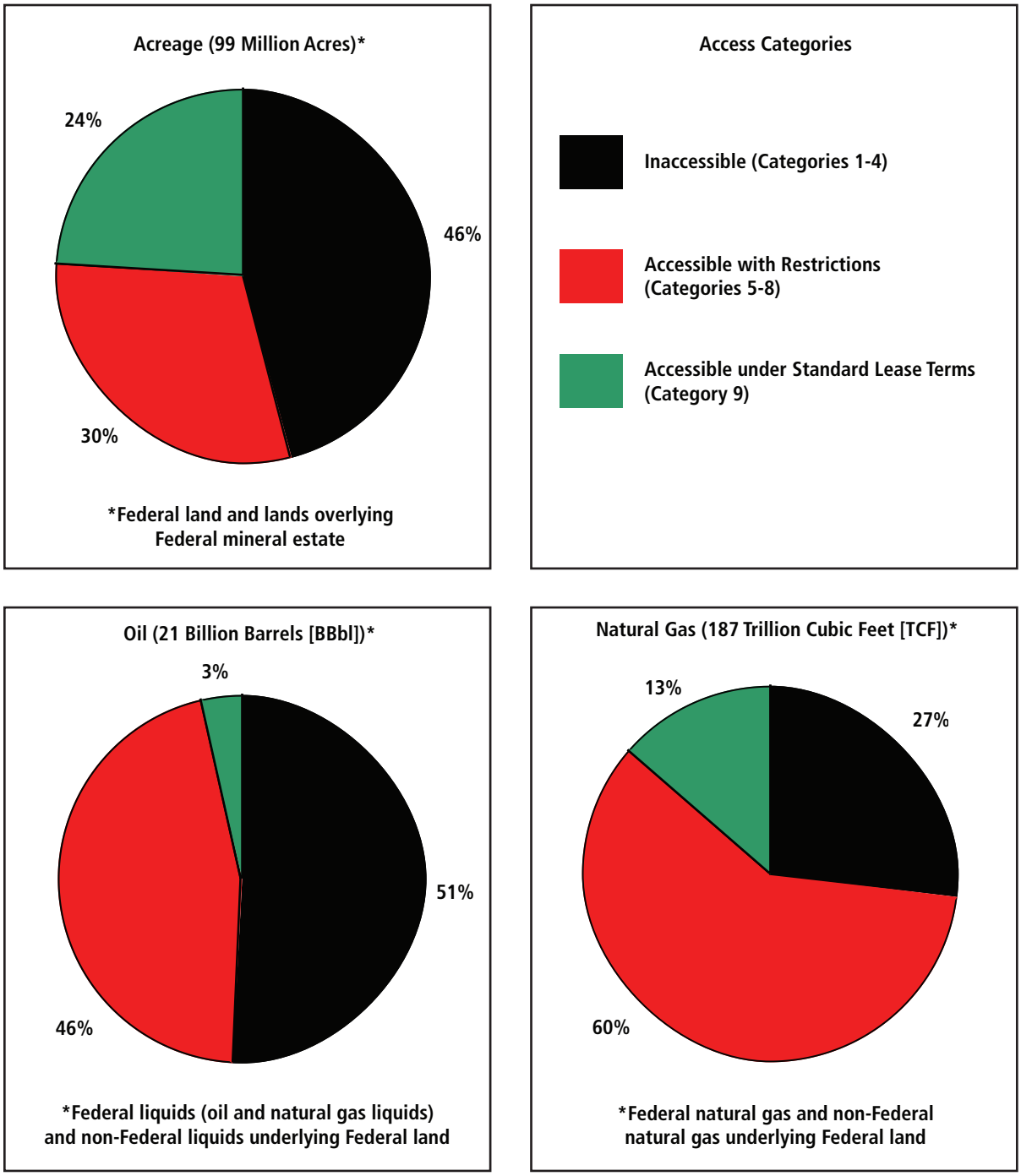

Figure ES-2. Simplified Results; Summary of All Phase II Study Areas–Total Federal Land and Oil and Natural Gas Resources by Accessibility

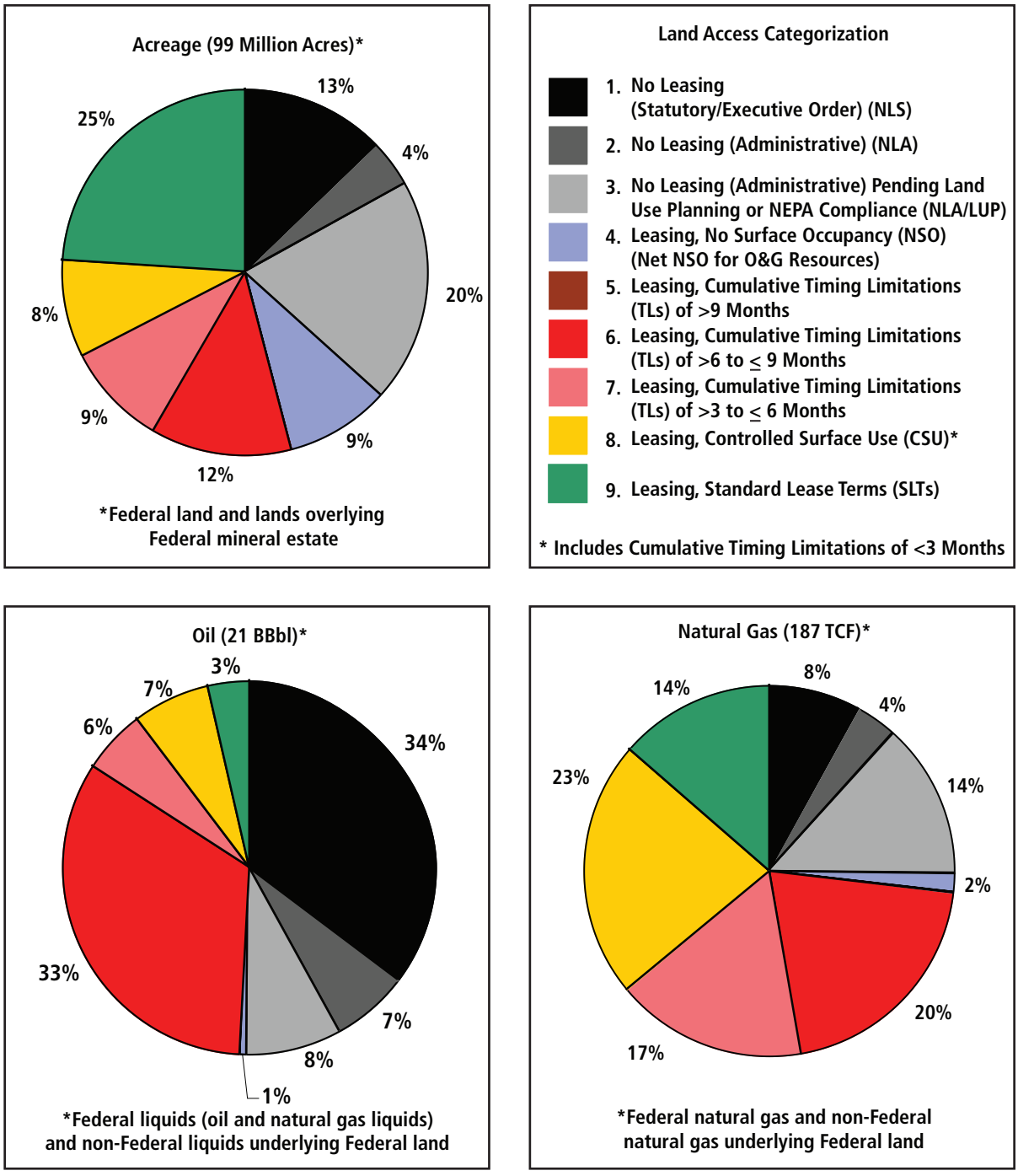

Figure ES-3. Results; Summary of All Phase II Study Areas–Total Federal Land and Oil and Natural Gas Resources by Access Category

Overall the study shows that oil and gas resources are concentrated in Northern Alaska and the Interior West. Figure ES-4 summarizes the accessibility of these resources (on a trillion cubic feet-equivalent basis).

Compliance With The Law

All oil and gas leases on Federal land, including those issued with only the standard lease terms, are subject to full compliance with all environmental laws and regulations. These laws include, but are not limited to, the National Environmental Policy Act, Clean Water Act, Clean Air Act, Endangered Species Act, and 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 believes 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 forthcoming deliberations on the role of Federal lands in the U.S. energy supply.

It is important to emphasize that this inventory was prepared at the direction of Congress. It is not a decision-making document. The inventory identifies areas of varying oil and gas potential and the nature of constraints to the development of those resources in eleven areas across the U.S. Any reassessment of restrictions on oil and gas activities will occur as part of the public land use planning or legislative processes, both of which are fully open to public participation and debate about the appropriate balance between resource protection and resource development.

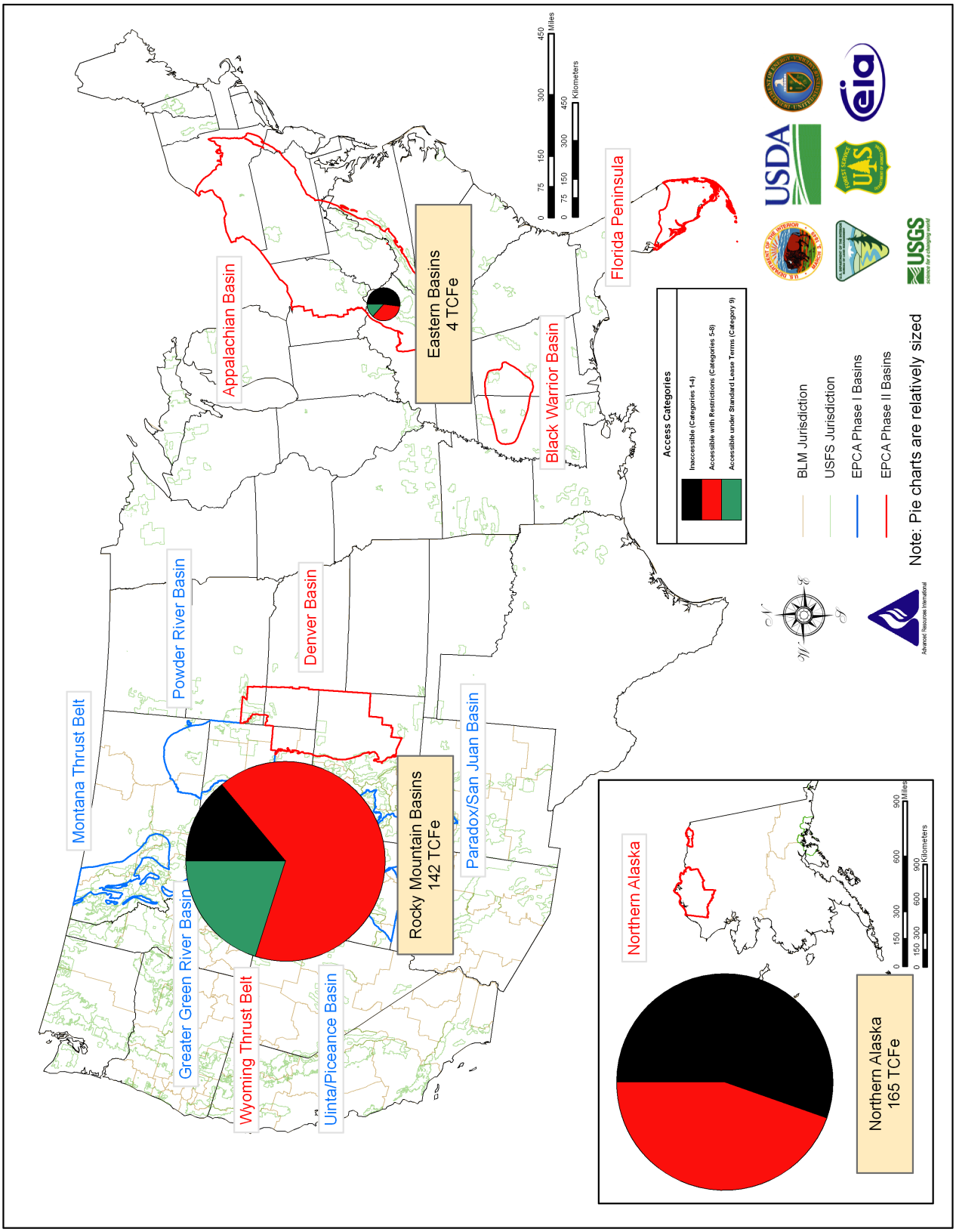

Figure ES-4. Regional Charts