

National Assessment of Oil and Gas Fact Sheet

Assessment of Undiscovered Oil and Gas Resources of the Southwestern Wyoming Province, 2002

Using a geology-based assessment methodology, the U.S. Geological Survey estimated a mean of 84.6 trillion cubic feet of undiscovered natural gas, a mean of 131 million barrels of undiscovered oil, and a mean of 2.6 billion barrels of undiscovered natural gas liquids in the Southwestern Wyoming Province.

Introduction

The U.S. Geological Survey (USGS) recently completed an assessment of the undiscovered oil and gas potential of the Southwestern Wyoming Province (fig. 1). The USGS Southwestern Wyoming Province for this assessment included the Green River Basin, Moxa arch, Hoback Basin, Sandy Bend arch, Rock Springs uplift, Great Divide Basin, Wamsutter arch, Washakie Basin, Cherokee Ridge, and the Sand Wash Basin. The assessment of the Southwestern Wyoming Province is based on the geologic elements of each Total Petroleum System (TPS) defined in the province, including hydrocarbon source rocks (source-rock maturation, hydrocarbon generation and migration), reservoir rocks (sequence stratigraphy and petrophysical properties), and hydrocarbon traps (trap formation and timing). Using this geologic framework, the USGS defined nine Total Petroleum Systems (TPS) and 23 Assessment Units (AU) within these TPSs and quantitatively estimated the undiscovered oil and gas resources within 21 of the 23 AUs (table 1).

Resource Summary

The USGS assessed undiscovered conventional oil and gas and undiscovered continuous (unconventional) oil and gas. The USGS estimated a mean of 84.6 trillion cubic feet of gas (TCFG), a mean of 131 million barrels of oil (MMBO), and a mean of 2.6 billion barrels of total natural gas liquids (BBNGL) in nine TPSs. Nearly all (97 percent, or 82.1 TCFG) of the undiscovered gas resource is continuous and distributed in six Total Petroleum Systems: Mowry Composite TPS (8.5 TCFG); Hilliard-Baxter-Mancos TPS (11.7 TCFG); Mesaverde TPS (25.8 TCFG); Mesaverde-Lance-Ft. Union Composite TPS (13.7 TCFG); Lewis TPS (13.5 TCFG); and Lance-Ft. Union Composite TPS (8.7 TCFG) (table 1). The remainder of the undiscovered gas is associated/dissolved gas in oil accumulations (0.13 TCFG) or is in conventional nonassociated gas accumulations (2.3 TCFG).

The Niobrara TPS is estimated to contain a mean of about 103 MMB of continuous oil, or about 79 percent of all undiscovered oil. The Phosphoria TPS contains a



Figure 1. Southwestern Wyoming Province of southwestern Wyoming and northwestern Colorado.

mean of 16.6 MMBO, or about 12.5 percent of the undiscovered oil. The remainder of the undiscovered oil is in the Mowry TPS, the Mesaverde TPS, and the Mesaverde-Lance-Ft. Union Composite TPS (table 1). The Niobrara Continuous Gas AU and the Wasatch-Green River Continuous Gas AU were not quantitatively assessed in this study.

For Further Information

Supporting geologic studies of Total Petroleum Systems and Assessment Units, and reports on the methodology used in the Southwestern Wyoming Province assessment, are in progress. Assessment results are available at the USGS Central Energy Team website: <http://energy.cr.usgs.gov/oilgas/noga/>

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Table 1. Southwestern Wyoming Province assessment results.

[MMBO, million barrels of oil; BCFG, billion cubic feet of gas; MMBNGL, million barrels of natural gas liquids. Results shown are fully risked estimates. For gas fields, all liquids are included under the NGL (natural gas liquids) category. F95 denotes a 95-percent chance of at least the amount tabulated. Other fractiles are defined similarly. Fractiles are additive only under the assumption of perfect positive correlation. CBG, coal-bed gas. Shading indicates not applicable]

	Field type	Oil (MMBO)				Total undiscovered resources Gas (BCFG)				NGL (MMBNGL)				
		F95	F50	F5	Mean	F95	F50	F5	Mean	F95	F50	F5	Mean	
		Total Petroleum Systems (TPS) and Assessment Units (AU)												
Conventional Oil and Gas Resources	Phosphoria TPS													
	Sub-Cretaceous Conventional Oil and Gas AU	Oil	3.80	12.70	43.60	16.60	6.70	24.00	85.90	32.20	0.20	0.80	3.20	1.20
		Gas					206.20	1,069.00	3,480.00	1,350.70	5.90	31.20	107.20	40.60
	Mowry Composite TPS													
	Mowry Conventional Oil and Gas AU	Oil	1.70	5.70	14.80	6.60	2.70	9.40	25.90	11.20	0.30	1.30	3.70	1.60
		Gas					85.80	196.30	301.40	195.10	1.60	3.80	6.70	3.90
	Hilliard-Baxter-Mancos TPS													
	Hilliard-Baxter-Mancos Conventional Oil and Gas AU	Gas					4.60	13.80	31.90	15.50	0.30	0.90	2.10	1.00
	Mesaverde TPS													
	Mesaverde Conventional Oil and Gas AU	Oil	0.90	2.10	4.00	2.30	7.40	17.30	34.80	18.80	0.30	0.60	1.40	0.70
		Gas					13.40	34.00	69.40	36.90	0.10	0.40	0.90	0.40
	Mesaverde-Lance-Ft. Union Composite TPS													
	Mesaverde-Lance-Ft. Union Conventional Oil and Gas AU	Oil	0.90	2.10	4.00	2.30	3.80	9.10	18.30	9.80	0.20	0.40	0.90	0.40
		Gas					101.40	297.70	558.80	310.40	4.20	13.00	26.90	14.00
Lewis TPS														
Lewis Conventional Oil and Gas AU	Gas					103.70	188.90	304.00	194.60	3.70	7.40	13.30	7.80	
Lance-Ft. Union Composite TPS														
Lance-Ft. Union Conventional Oil and Gas AU	Gas					75.00	229.20	465.90	245.60	0.70	2.20	5.00	2.50	
Total Conventional Resources		7.30	22.60	66.40	27.80	610.70	2,088.70	5,376.30	2,420.80	17.50	62.00	171.30	74.10	
Continuous Oil and Gas Resources	Mowry Composite TPS													
	Mowry Continuous Gas AU	Gas				6,745.90	8,461.90	10,614.40	8,542.80	110.90	165.80	247.90	170.90	
	Niobrara TPS													
	Niobrara Continuous Oil AU	Oil	66.90	100.50	151.00	103.60	34.90	59.10	99.90	62.20	1.90	3.50	6.50	3.70
	Niobrara Continuous Gas AU	Gas	Not quantitatively assessed											
	Hilliard-Baxter-Mancos TPS													
	Hilliard-Baxter-Mancos Continuous Gas AU	Gas					4,895.10	10,542.00	22,703.40	11,753.20	286.50	661.10	1,525.20	752.20
	Mesaverde TPS													
	Almond Continuous Gas AU	Gas					10,013.50	13,166.10	17,311.30	13,349.70	113.50	190.60	319.90	200.20
	Rock Springs-Ericson Continuous Gas AU	Gas					8,768.90	11,962.80	16,320.00	12,178.00	89.20	140.70	221.70	146.10
	Mesaverde Coal-Bed Gas AU	CBG					126.10	232.10	427.30	248.70	0.00	0.00	0.00	0.00
	Mesaverde-Lance-Ft. Union Composite TPS													
	Mesaverde-Lance-Ft. Union Continuous Gas AU	Gas					8,320.10	13,122.00	20,695.40	13,635.20	329.20	578.60	1,016.90	613.60
	Mesaverde Coal-Bed Gas AU	CBG					13.70	25.40	47.30	27.30	0.00	0.00	0.00	0.00
	Ft. Union Coal-Bed Gas AU	CBG					35.30	73.20	151.90	80.80	0.00	0.00	0.00	0.00
	Lewis TPS													
	Lewis Continuous Gas AU	Gas					8,764.90	13,132.80	19,667.40	13,535.70	305.00	514.70	868.70	541.40
	Lance-Ft. Union Composite TPS													
	Lance-Ft. Union Continuous Gas AU	Gas					4,450.60	7,255.80	11,829.10	7,583.30	39.40	71.10	128.40	75.80
Lance Coal-Bed Gas AU	CBG					78.20	152.00	295.50	165.00	0.00	0.00	0.00	0.00	
Ft. Union Coal-Bed Gas AU	CBG					513.90	891.20	1,545.40	942.50	0.00	0.00	0.00	0.00	
Wasatch-Green River Composite TPS														
Wasatch-Green River Continuous Gas AU	Gas	Not quantitatively assessed												
Wasatch-Green River Coal-Bed Gas AU	CBG					27.80	58.40	122.60	64.70	0.00	0.00	0.00	0.00	
Total Continuous Resources		66.90	100.50	151.00	103.60	52,788.90	79,134.80	121,830.90	82,169.10	1,275.60	2,326.10	4,335.20	2,503.90	
Total Undiscovered Oil and Gas Resources		74.20	123.10	217.40	131.40	53,399.60	81,223.50	127,207.20	84,589.90	1,293.10	2,388.10	4,506.50	2,578.00	