

## National Assessment of Oil and Gas Fact Sheet

# Assessment of Undiscovered Oil and Gas Resources of the San Juan Basin Province of New Mexico and Colorado, 2002

Using a geology-based assessment methodology, the U.S. Geological Survey estimated a mean of 50.6 trillion cubic feet of undiscovered natural gas, a mean of 19 million barrels of undiscovered oil, and a mean of 148 million barrels of natural gas liquids in the San Juan Basin Province.



Figure 1. San Juan Basin Province of northwestern New Mexico and southwestern Colorado.

## Introduction

The U.S. Geological Survey (USGS) recently completed an assessment of the undiscovered oil and gas potential of the San Juan Basin Province of northwestern New Mexico and southwestern Colorado (fig. 1). The assessment of the San Juan Basin Province is based on the geologic elements of each Total Petroleum System 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 four Total Petroleum Systems and 14 Assessment Units within these Total Petroleum Systems and quantitatively estimated the undiscovered oil and gas resources within the 14 Assessment Units (table 1).

## Resource Summary

The USGS assessed undiscovered conventional oil and gas and continuous (unconventional) gas. The USGS estimated a mean of 50.6 trillion cubic feet of gas (TCFG), a mean of 19 million barrels of oil (MMBO), and a mean of 148 million barrels of total natural gas liquids (MMBNGL) in four Total Petroleum Systems. Nearly all (99.9 percent) of the undiscovered gas resource is continuous (table 1). Of the 50.6 TCFG of undiscovered gas at the mean, about 29.2 TCFG is estimated to be in the Fruitland Total Petroleum System; 80 percent of this 29.2 TCFG (23.5 TCFG) is Fruitland TPS coal-bed gas. The Lewis Total Petroleum System is estimated to contain a mean of 10.2 TCFG, and the Mancos-Menefee Total Petroleum System is estimated to contain a mean of 11 TCFG, of which about 6 percent (0.67 TCFG) is coal-bed gas (table 1).

The Mancos-Menefee Total Petroleum System contains a mean of about 16.8 MMB of undiscovered conventional oil, representing about 88 percent of the undiscovered oil (19.1 MMBO) in the province. The remainder of the undiscovered conventional oil is estimated to be in Jurassic Entrada Sandstone reservoirs of the Todilto Total Petroleum System.

**Table 1. San Juan Basin 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 under the assumption of perfect positive correlation. CBG, coal-bed gas. Gray shading indicates not applicable]

	Field type	Total undiscovered resources											
		Oil (MMBO)				Gas (BCFG)				NGL (MMBNGL)			
		F95	F50	F5	Mean	F95	F50	F5	Mean	F95	F50	F5	Mean
<b>Total Petroleum Systems (TPS) and Assessment Units (AU)</b>													
<b>Fruitland TPS</b>													
Tertiary Conventional Gas AU	Gas					25.76	74.40	152.91	79.98	0.23	0.73	1.83	0.84
<b>Mancos-Menefee Composite TPS</b>													
Mesaverde Updip Conventional Oil		not quantitatively assessed											
Gallup Sandstone Conventional Oil and Gas AU	Oil	0.00	1.98	6.29	2.34	0.00	0.29	0.98	0.35	0.00	0.00	0.01	0.00
Mancos Sandstone Conventional Oil and Gas AU	Oil	5.41	11.33	20.72	11.99	23.34	53.28	106.75	57.57	0.84	2.07	4.52	2.30
Dakota-Greenhorn Conventional Oil and Gas AU	Oil	0.78	2.26	4.73	2.45	2.53	7.49	17.10	8.34	0.02	0.07	0.16	.08
	Gas					5.59	12.63	22.40	13.35	0.22	0.50	0.96	0.53
<b>Todilto TPS</b>													
Entrada Sandstone Conventional Oil	Oil	0.81	2.19	4.18	2.32	1.84	5.15	10.66	5.56	0.07	0.20	0.45	0.22
<b>Total Conventional Resources</b>													
		7.00	17.76	35.92	19.10	59.06	153.24	310.80	165.15	1.38	3.57	7.93	3.97
<b>Continuous Oil and Gas Resources</b>													
<b>Fruitland TPS</b>													
Pictured Cliffs Continuous Gas	Gas					3,865.41	5,510.68	7,856.23	5,640.25	9.07	15.95	28.06	16.92
Fruitland Fairway Coal-Bed Gas	CBG					3,081.06	3,937.16	5,031.14	3,981.14	0.00	0.00	0.00	0.00
Basin Fruitland Coal-Bed Gas	CBG					17,342.26	19,543.12	22,023.27	19,594.74	0.00	0.00	0.00	0.00
<b>Lewis Shale TPS</b>													
Lewis Continuous Gas	Gas					8,315.22	10,105.95	12,282.31	10,177.24	18.08	29.25	47.32	30.53
<b>Mancos-Menefee Composite TPS</b>													
Mesaverde Central-Basin Continuous Gas	Gas					1,053.32	1,305.62	1,618.35	1,316.79	3.44	5.12	7.60	5.27
Mancos Sandstone Continuous Gas	Gas					3,980.80	5,062.07	6,437.03	5,116.37	50.64	73.97	108.04	75.96
Dakota-Greenhorn Continuous Gas	Gas					3,148.66	3,896.17	4,821.14	3,928.98	10.29	15.27	22.66	15.72
Menefee Coal-Bed Gas	CBG					228.30	569.08	1,418.55	663.94	0.00	0.00	0.00	0.00
<b>Total Continuous Resources</b>													
						41,015.03	49,929.85	61,488.02	50,419.45	91.52	139.56	213.68	144.40
<b>Total Undiscovered Oil and Gas Resources</b>													
		7.00	17.76	35.92	19.10	41,074.09	50,083.09	61,798.82	50,584.60	92.90	143.13	221.61	148.37

**For Further Information**

Supporting geologic studies of Total Petroleum Systems and Assessment Units, and reports on the methodology used in the San Juan Basin 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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