

3. Crude Oil Statistics

Proved Reserves

The United States had 21,317 million barrels of crude oil proved reserves as of December 31, 2007. This is 2 percent (345 million barrels) more than in 2006. The principal factors contributing to the increase were large positive net revisions and larger-than-average extensions to existing oil fields.

Alaska had the largest increase in year-end crude oil proved reserves, growing 7 percent over 2006 (284 million barrels), followed closely by Texas with an increase in year-end proved reserves of 5 percent (251 million barrels). Alaska's increase included 45 million barrels of new field discoveries. Due to rapid development of unconventional oil resources associated with the Bakken Formation, North Dakota had the third largest volumetric increase in crude oil proved reserves, up 17 percent from 2006 (70 million barrels).

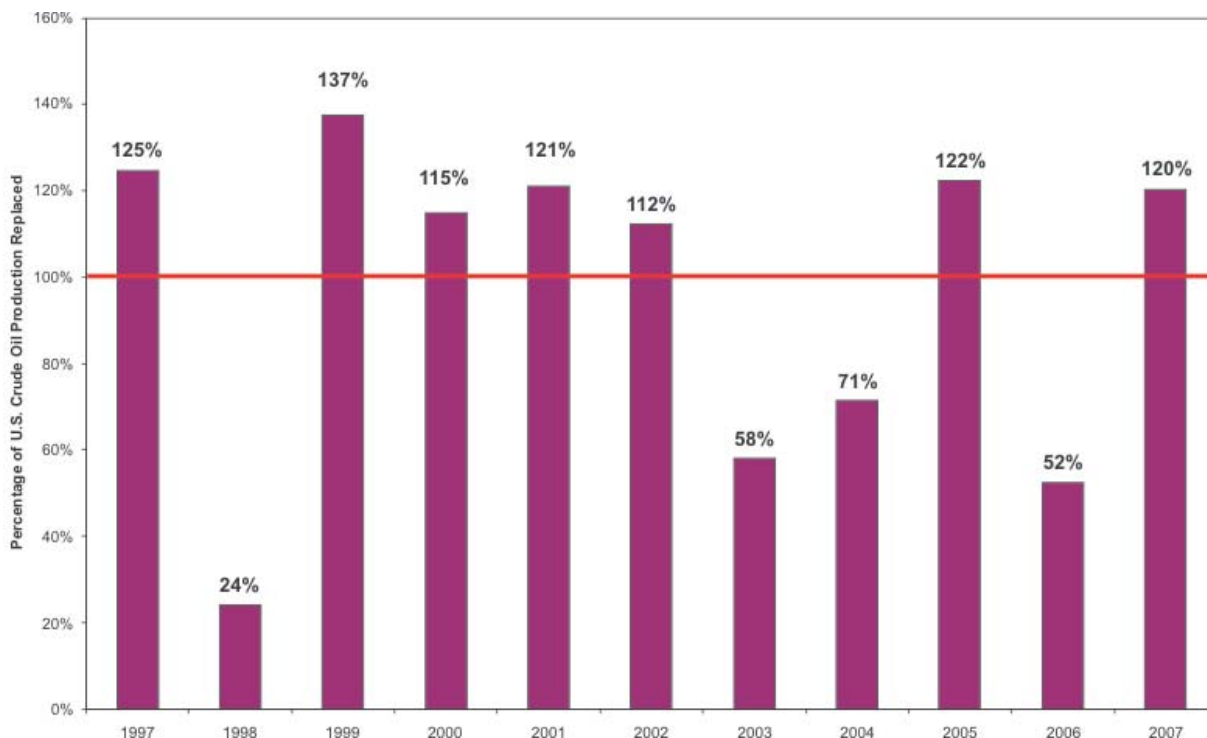
Reserves additions of crude oil in the U.S. replaced 120 percent of 2007 crude oil production (**Figure 15**).

Table 6 presents the U.S. proved reserves of crude oil as of December 31, 2007, by selected States and State subdivisions. **Figure 16** maps 2007 crude oil proved reserves by area.

The following four areas account for 76 percent of U.S. crude oil proved reserves:

Area	Percent of 2007 U.S. Oil Reserves
Texas	24
Alaska	20
Gulf of Mexico Federal Offshore	16
California	16
Area Subtotal	76

Figure 15. Replacement of U.S. Crude Oil Production by Reserves Additions, 1997-2007.



Source: Energy Information Administration, Office of Oil and Gas.

Table 6. Crude Oil Proved Reserves, Reserves Changes, and Production, 2007
(million barrels of 42 U.S. gallons)

State and Subdivision	Published Proved Reserves 12/31/06	Changes in Reserves During 2007									Proved Reserves 12/31/07
		Adjustments (+,-)	Revision Increases (+)	Revision Decreases (-)	Sales (-)	Acquisitions (+)	Extensions (+)	New Field Discoveries (+)	New Reservoir Discoveries in Old Fields (+)	Estimated Production (-)	
Alaska	3,879	0	487	34	9	16	40	45	0	261	4,163
Lower 48 States	17,093	65	1,791	1,044	802	776	611	21	73	1,430	17,154
Alabama	45	1	4	1	3	1	0	0	0	5	42
Arkansas	37	-2	4	2	0	0	0	0	0	6	31
California	3,389	-6	248	144	10	38	27	0	0	220	3,322
Coastal Region Onshore	375	3	44	19	5	9	1	0	0	15	393
Los Angeles Basin Onshore	364	-8	24	16	0	21	1	0	0	17	369
San Joaquin Basin Onshore	2,448	-2	160	104	2	8	16	0	0	173	2,351
State Offshore	202	1	20	5	3	0	9	0	0	15	209
Colorado	274	1	38	14	1	1	24	0	0	19	304
Florida	38	-1	21	0	37	14	0	0	0	3	32
Illinois	89	-4	10	0	2	0	16	0	0	8	101
Indiana	12	5	3	1	0	0	0	0	0	2	17
Kansas	263	-32	30	27	0	0	4	0	4	36	206
Kentucky	25	0	1	0	0	0	0	0	0	2	24
Louisiana	428	47	59	48	29	41	13	0	1	54	458
North	68	21	6	5	11	6	0	0	0	9	76
South Onshore	312	23	31	34	18	35	13	0	1	37	326
State Offshore	48	3	22	9	0	0	0	0	0	8	56
Michigan	63	2	2	6	5	3	1	0	0	5	55
Mississippi	186	9	24	9	1	6	6	0	1	22	200
Montana	419	5	37	35	43	38	24	0	0	35	410
Nebraska	14	-2	3	0	1	0	0	0	0	2	12
New Mexico	705	24	76	62	38	43	41	0	0	54	735
East	696	23	74	61	38	43	41	0	0	53	725
West	9	1	2	1	0	0	0	0	0	1	10
North Dakota	412	2	55	28	50	52	80	1	3	45	482
Ohio	49	2	10	11	0	0	2	0	0	4	48
Oklahoma	569	-52	142	50	80	28	25	0	1	53	530
Pennsylvania	20	-5	2	4	0	0	1	0	0	2	12
Texas	4,871	65	575	241	212	222	183	2	7	350	5,122
RRC District 1	76	3	15	2	1	1	2	0	0	10	84
RRC District 2 Onshore	65	1	5	2	2	2	0	0	0	7	62
RRC District 3 Onshore	180	8	25	27	15	46	8	0	1	26	200
RRC District 4 Onshore	30	4	6	4	6	2	1	0	1	4	30
RRC District 5	24	3	2	1	0	0	0	0	0	3	25
RRC District 6	157	0	33	7	15	3	2	0	1	14	160
RRC District 7B	89	3	15	1	6	2	0	0	0	9	93
RRC District 7C	288	16	21	16	25	33	29	0	1	21	326
RRC District 8	1,717	14	194	84	101	95	71	0	3	113	1,796
RRC District 8A	2,093	9	226	89	31	28	65	2	0	124	2,179
RRC District 9	96	13	20	1	0	0	0	0	0	13	115
RRC District 10	53	-8	12	6	10	10	5	0	0	6	50
State Offshore	3	-1	1	1	0	0	0	0	0	0	2
Utah	334	-8	25	3	0	1	23	0	0	17	355
West Virginia	23	0	7	0	0	0	0	0	0	2	28
Wyoming	706	10	36	34	72	69	18	0	0	43	690
Federal Offshore	4,096	3	372	324	218	219	122	18	56	439	3,905
Pacific (California)	441	2	14	8	3	20	0	0	0	25	441
Gulf of Mexico (Louisiana)	3,500	1	335	298	212	195	111	4	56	372	3,320
Gulf of Mexico (Texas)	155	0	23	18	3	4	11	14	0	42	144
Miscellaneous ^a	26	1	7	0	0	0	1	0	0	2	33
U.S. Total	20,972	65	2,278	1,078	811	792	651	66	73	1,691	21,317

^aIncludes Arizona, Missouri, Nevada, New York, South Dakota, Tennessee, and Virginia.

Note: The production estimates in this table are based on data reported on Form EIA-23, "Annual Survey of Domestic Oil and Gas Reserves." They may differ from the official Energy Information Administration production data for crude oil for 2007 contained in the *Petroleum Supply Annual 2007*, DOE/EIA-0340(07).

Source: Energy Information Administration, Office of Oil and Gas.

Figure 16. Crude Oil Proved Reserves by Area, 2007

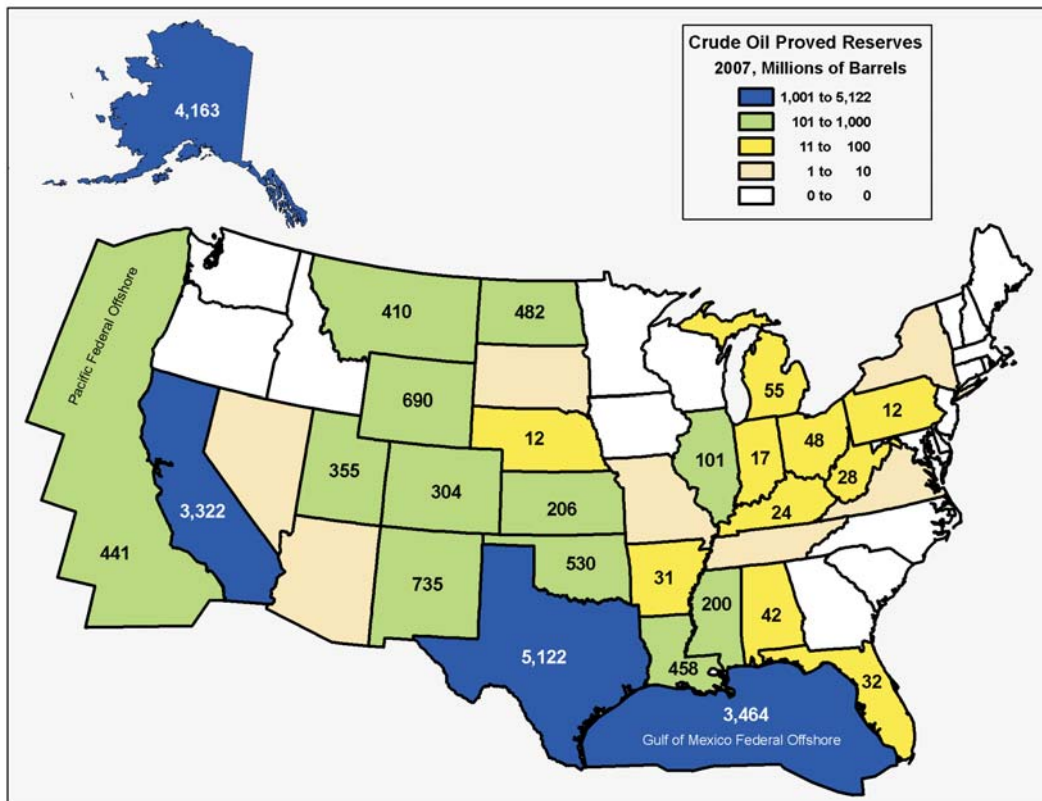
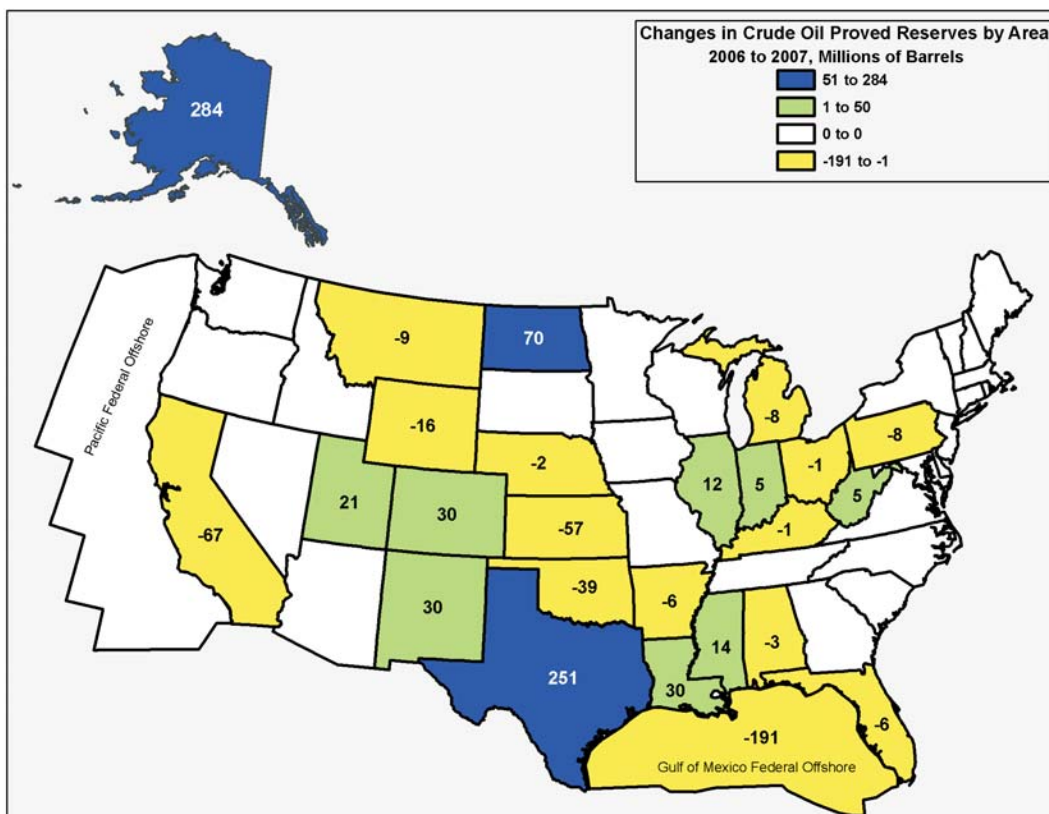


Figure 17. Changes in Crude Oil Proved Reserves by Area, 2006 to 2007



Source: Energy Information Administration, Office of Oil and Gas.

Discussion of Reserves Changes

The following graphic portrays the beginning- and end-of-year crude oil proved reserves, and the components of crude oil proved reserves change during 2007, at the same volumetric scale. Note that the scale starts at 20 billion barrels rather than at zero.

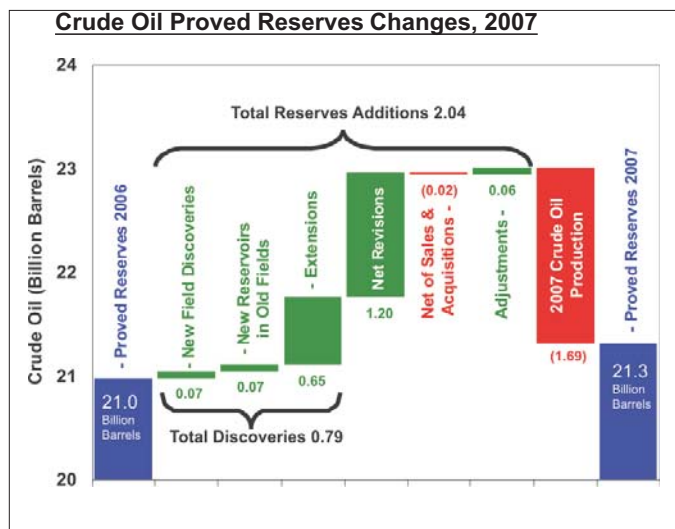


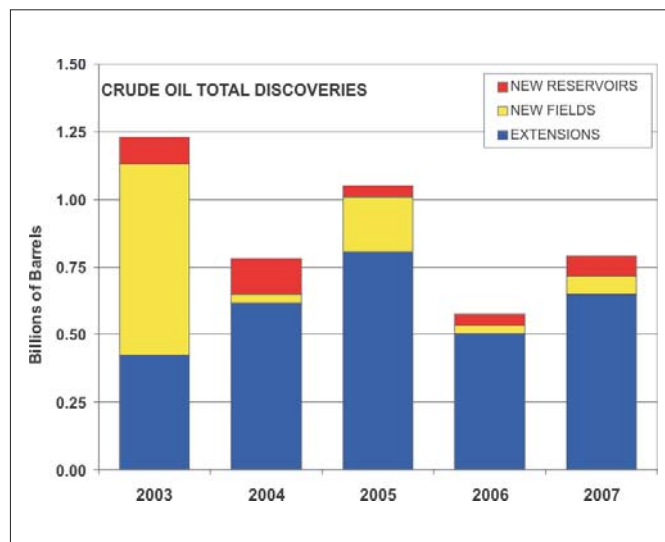
Figure 17 maps the change in crude oil proved reserves from 2006 to 2007 by area. The table below shows how the top four areas fared compared to the total United States:

Area	Change in 2007 U.S. Oil Reserves (million barrels)
Alaska	+284
Texas	+251
Gulf of Mexico Federal Offshore	-191
California	-67
Area Subtotal	+277
U.S. Total	+345

Figure 2 in Chapter 2 shows the components of the changes in crude oil proved reserves for 2007 and the preceding 10 years.

Total Discoveries

Total discoveries are those new reserves attributable to extensions of existing fields, new field discoveries, and new reservoir discoveries in old fields (see graph below). They result from the drilling of exploratory wells.



Total discoveries of crude oil were 790 million barrels in 2007, 37 percent more than those of 2006 (577 million barrels), but 28 percent less than the prior 10-year average (1,100 million barrels).

Only five areas had total discoveries of 35 million barrels or more in 2007:

Area	Percent of 2007 U.S. Oil Total Discoveries
Federal Offshore Gulf of Mexico	25
Texas	24
Alaska	11
North Dakota	11
New Mexico	5
Area Subtotal	76

Extensions

Operators reported 651 million barrels of extensions in 2007, 29 percent more than in 2006. The highest volume of extensions was reported in Texas (183 million barrels). The second highest volume of 2007 extensions was 122 million barrels in the Gulf of Mexico Federal Offshore, followed by 80 million barrels in North Dakota.

In the prior 10 years, U.S. operators reported an average of 554 million barrels of extensions per year. The 2007 extensions were 18 percent above that average.

New Field Discoveries

New field discoveries accounted for 66 million barrels of crude oil reserves additions. This was more than twice the new field discoveries of 2006 (30 million

barrels). Sixty-eight percent of 2007 new field discoveries (45 of 66 million barrels) were in Alaska.

In the prior 10 years, U.S. operators reported an annual average of 407 million barrels of reserves additions from new field discoveries. Reserves from new field discoveries in 2007 were 16 percent of that average.

New Reservoir Discoveries in Old Fields

Operators reported 73 million barrels of crude oil reserves additions from new reservoir discoveries in old fields in 2007. This is 70 percent more than in 2006. The majority of the new reservoir discoveries in old fields (56 of 73 million barrels) came from the Gulf of Mexico Federal Offshore.

In the prior 10 years, U.S. operators reported an annual average of 140 million barrels of reserves from new reservoir discoveries in old fields. Reserves from new reservoir discoveries in old fields in 2007 were 52 percent of that average.

Revisions and Adjustments

Operators report thousands of positive and negative revisions to proved reserves each year as development wells are drilled, well performance is analyzed, new technology is applied, or economic conditions change. Adjustments are the annual changes in the published reserve estimates that cannot be directly attributed to the estimates for other reserve change categories. They result instead from the survey and statistical estimation methods employed.

There were 2,278 million barrels of revision increases, 1,078 million barrels of revision decreases, and 65 million barrels of adjustments in 2007. Combined, there were 1,265 million barrels of net revisions and adjustments for crude oil in 2007.

In the prior 10 years, net revisions and adjustments added an annual average of 677 million barrels. The 2007 net revisions and adjustments were almost twice that average.

Sales and Acquisitions

In the context of this report, *Sales* represents the volume of crude oil proved reserves deducted from an operator's total reserves by sale or transfer of operations of existing oil fields or properties to another operator, instead of a volume of production "sold" at the wellhead. Similarly, *Acquisitions* is that volume of

proved reserves added to an operator's total reserves through purchase or operations transfer of an existing oil field or properties.

There are several reasons why sales and acquisitions volumes are not equal for a given year. Since operators have different engineering staffs and resources, or different development plans or schedules, the estimate of proved reserves for a field can change upon a change in operatorship. Timing of the transfer of operations can also impact these values.

In 2007, there were 811 million barrels of sales transactions between operators and 792 million barrels of acquisitions transactions yielding a net difference of -19 million barrels.

Production

U.S. production of crude oil in 2007 was an estimated 1,691 million barrels. This volume, which does not include lease condensate, was 2 percent higher than 2006's production of 1,652 million barrels.

The Gulf of Mexico Federal Offshore remained the largest oil producing area in the United States in 2007 with 24 percent of the national total (414 million barrels of production). Texas and Alaska were second and third, with 21 and 15 percent of the national production total, respectively. California was fourth with 13 percent.

Alaskan oil production increased the most in 2007, owing in part to repair work done in 2006 to the Prudhoe Bay Field's oil pipeline gathering system. Its production rose 19 million barrels, an 8-percent increase. The Gulf of Mexico Federal Offshore had the second largest production increase in 2007 (8 million barrels, a 2-percent increase).

North Dakota had the third largest annual oil production increase of any State (7 million barrels, an 18-percent increase) owing to continued development of the unconventional Bakken Formation.

The 2007 Form EIA-23 national production estimates (1,691 million barrels of crude oil and 181 million barrels of lease condensate) are 1 percent higher than the comparable *Petroleum Supply Annual (PSA) 2007* volumes for crude oil and lease condensate production combined (1,848 million barrels).

Areas of Note: Large Discoveries and Reserves Additions

The following State and area discussions summarize notable activities during 2007 concerning expected new field reserves, development plans, and possible production rates as reported in various trade publications. The citations do not necessarily reflect EIA's concurrence, but are considered important enough to be brought to the reader's attention.

The following areas were the major success stories for crude oil reserves and production for 2007.

Alaska

Alaska reported the largest increase (284 million barrels) of proved oil reserves in 2007. The majority of these reserves additions were reported as revision increases. Alaska also had the largest volume of new field discoveries in the Nation in 2007.

- **Nikaichuq Field:** One example of new development in Alaska is the Nikaichuq Field. The operator, Eni Energy, reported that it planned to drill approximately 80 wells, 32 from onshore locations and the remaining 48 from an artificial offshore island. The wells will then be tied back to a production facility located at Oliktok Point and may produce as much as 40,000 barrels per day. {41} (ENI Press Release, April 11, 2007)

Texas

Texas reported a net increase of 251 million barrels of crude oil proved reserves in 2007. As in Alaska, the majority of the proved reserves additions in Texas came from revisions. But 30 percent of total Texas reserves additions (183 million barrels out of 601 million barrels) were extensions. This was the largest volume of extensions in the Nation and primarily occurred in west Texas.

- **Seminole Field:** In May, Amerada Hess, operator of the Seminole San Andres Unit (SSAU), announced plans for an approximate \$300 million investment to expand its CO₂ enhanced oil recovery project in this large, mature field. A difficult-to-produce resource, termed a Residual Oil Zone (ROZ), lies directly underneath the field's main pay zone and contains nearly one billion barrels of estimated technically recoverable resources. However, the chemistry of the oil within the ROZ prevents it

from moving without additional treatment. Amerada Hess planned to deepen 47 production wells into the ROZ, and then convert 29 wells from production to carbon dioxide injection; the injected carbon dioxide would then mobilize the otherwise trapped oil and increase recovery. Amerada Hess has successfully operated one pilot program in the ROZ since 1994 and a second pilot program since 2004, resulting in this expansion. (Excerpted from Seminole Sentinel, May 20, 2007)

North Dakota

North Dakota reported the Nation's third largest net increase in proved crude oil reserves in 2007 -- 70 million barrels (17 percent over its 2006 total). These increases come largely from the unconventional Bakken Formation, a deep, predominantly shale formation which produces light, sweet crude oil when fractured. North Dakota's production increased from 38 million barrels in 2006 to 45 million barrels in 2007.

- **Bakken Formation (Parshall Field):** EOG Resources, Inc. reported successful drilling in the unconventional Bakken Formation in North Dakota where it had accumulated approximately 320,000 net acres. During 2007, EOG increased its estimated reserves in the Bakken from 60 to approximately 80 million barrels of oil, net. {42} (EOG Letter to Stockholders, Annual Report 2007)

Other Gain Areas

Colorado, Louisiana, and New Mexico: Colorado, Louisiana, and New Mexico all reported a net increase of 30 million barrels of crude oil proved reserves in 2007.

Areas of Note: Large Declines in Reserves

The following areas had large declines in crude oil proved reserves due to downward revisions or unreplaced production.

Gulf of Mexico Federal Offshore

The Gulf of Mexico Federal Offshore crude oil proved reserves declined 5 percent (191 million barrels) in 2007. However, crude oil production increased 2

percent from 405 million barrels in 2006 to 414 million barrels in 2007.

California

California crude oil proved reserves declined 2 percent (67 million barrels) in 2007. Production exceeded reserves additions despite 27 million barrels of extensions, positive net revisions, and net acquisitions of crude oil proved reserves. California's estimated 2007 production of 220 million barrels decreased 1 percent from the 2006 level (222 million barrels).

Kansas

There was a 22 percent decline (57 million barrels) in Kansas' crude oil proved reserves in 2007. However, Kansas crude oil production increased 3 percent from its 2006 level.

Other Decline Areas

Discovery and development of new or existing oil fields were also outpaced by crude oil production in the following areas of the United States:

Oklahoma: Proved oil reserves decreased by 7 percent (39 million barrels).

Wyoming: Proved oil reserves decreased by 2 percent (16 million barrels).

Reserves in Nonproducing Status

Not all proved reserves of crude oil reported in 2007 were producing. Operators reported 5,455 million barrels of proved reserves in nonproducing status in 2007, 5 percent more than in 2006 (5,174 million barrels). Nonproducing crude oil reserves (not including lease condensate) are listed in **Table 7**.

Nonproducing reserves are those awaiting well workovers, the drilling of extensions or additional development wells, installation of production or pipeline facilities, and depletion of other zones or reservoirs before recompletion in reservoirs not currently open to production.

Table 7. Reported Reserves in Nonproducing Status for Crude Oil, 2007^a
(million barrels of 42 U.S. gallons)

State and Subdivision	Nonproducing Crude Oil Reserves	State and Subdivision	Nonproducing Crude Oil Reserves
Alaska	400	Ohio	8
Lower 48 States	5,055	Oklahoma	118
Alabama	0	Pennsylvania	0
Arkansas	0	Texas	1,186
California	335	RRC District 1	27
Coastal Region Onshore	42	RRC District 2 Onshore	16
Los Angeles Basin Onshore	98	RRC District 3 Onshore	22
San Joaquin Basin Onshore	168	RRC District 4 Onshore	2
State Offshore	27	RRC District 5	1
Colorado	122	RRC District 6	18
Florida	12	RRC District 7B	1
Kansas	9	RRC District 7C	137
Kentucky	0	RRC District 8	454
Louisiana	193	RRC District 8A	484
North	11	RRC District 9	12
South Onshore	164	RRC District 10	12
State Offshore	18	State Offshore	0
Michigan	2	Utah	174
Mississippi	35	Virginia	0
Montana	90	West Virginia	0
New Mexico	147	Wyoming	208
East	147	Federal Offshore	2,304
West	0	Pacific (California)	20
New York	0	Gulf of Mexico (Louisiana) ^c	2,231
North Dakota	107	Gulf of Mexico (Texas)	53
		Miscellaneous ^b	5
		U.S. Total	5,455

^aIncludes only those operators who produced 400,000 barrels of crude oil or 2 billion cubic feet of natural gas, or both, during the report year (Category I or Category II operators).

^bIncludes Arizona, Illinois, Indiana, Maryland, Missouri, Nebraska, Nevada, Oregon, South Dakota, and Tennessee.

^cIncludes Federal Offshore Alabama.

Source: Form EIA-23, "Annual Survey of Domestic Oil and Gas Reserves," 2007.