Size-Frequency Analysis of Petroleum Accumulations in Selected United States Plays: Potential Analogues for Frontier Areas

By Emil D. Attanasi and Philip A. Freeman

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Conversion Factors

Multiply	By	To obtain
barrel (bbl), (petroleum, 1 barrel=42 gal)	0.1590	cubic meter (m^3)
cubic foot (ft^3)	0.02832	cubic meter (m^3)
foot (ft)	0.3048	meter (m)

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Size-Frequency Analysis of Petroleum Accumulations in Selected United States Plays: Potential Analogues for Frontier Areas

By Emil D. Attanasi and Philip A. Freeman

Abstract

This report presents the petroleum accumulation size-frequency relationships of selected mature plays assessed in the US Geological Survey's 1995 National Assessment of Oil and Gas Resources. The plays provide assessors with potential analogue models from which to estimate the numbers of undiscovered accumulations in medium and smaller size categories. Each play selected was required to have at least 50 "total" accumulations where "total" is defined as the sum of discovered plus the mean number of undiscovered accumulations assessed at the play level. There were 36 plays that met the criteria for oil accumulations and 25 plays that met the criteria for gas accumulations. Other properties of the plays such as primary trap type, lithology, depth, and hydrocarbon characteristics are also provided to assist the geologist in choosing an appropriate analogue. The text explains how the analogue size-frequency relationships can be used to estimate the number of small and medium size accumulations for frontier-area plays or partially explored plays in high cost areas. Although this document has been written in support of the Alaska North Slope Assessment, the basic size–frequency relationships provided are applicable elsewhere.

Introduction

Assessment of undiscovered conventional hydrocarbons frequently requires the geologist to estimate the sizes and numbers of accumulations remaining to be found. For areas with substantial drilling and discovery histories, assessors may use discovery process models to estimate the size-frequency distribution of remaining accumulations (Drew and Schuenemeyer, 1993, Kaufman, 1993). Extrapolations of the historical discovery sequence are not possible in frontier areas with little or no drilling and may be biased in areas where the development costs are so high that only very large accumulations have been commercially developed.

In areas where only seismic data are available or where development costs are high, assessors must make assumptions about the form of the parent accumulation size-frequency distributions and rely on auxiliary information to estimate numbers of undiscovered accumulations (Schuenemeyer, and Drew, 1983). In particular, the resolution of the available seismic data is generally inadequate for detection of smaller accumulations (Kaufman, 1994). In high cost areas, the historical discovery sequence has been filtered at an economic truncation point well above the minimum accumulation size that is of interest. In these cases, assessors may rely on information from analogue areas or plays to project the numbers of undiscovered accumulations.

This report presents the petroleum accumulation size-frequency relationships of selected mature plays assessed in the US Geological Survey's 1995 National Assessment of Oil and Gas Resources (Gautier and others, 1996). These plays provide assessors with potential analogue models from which to estimate the numbers of undiscovered accumulations in medium and smaller size categories. A play is defined as a set of known or postulated oil (or) gas accumulations having similar geologic, geographic, and temporal properties, such as source rock, migration pathways, timing, trapping mechanism, and hydrocarbon type.

Exploration firms often choose the petroleum play as the preferred level of regional assessment for undiscovered petroleum resources (Kaufman, 1993, Baker and others, 1984). Play level assessment consists of the estimation of the size and numbers of undiscovered accumulations. A conventional accumulation is a discrete deposit, usually bounded by a down-dip water contact and from which hydrocarbons can be extracted utilizing ordinary production practices. Although a field may be defined as one or more accumulations where the hydrocarbon fluids are in communication or where the accumulations are in close enough proximity to be developed as a unit, there is no universally accepted definition of a field. In fact, the classification of accumulations into fields may be arbitrary or for the convenience of regulators.

Field data can be too coarse to capture *exploration potential*. For example, depending on its location, a newly discovered accumulation might be assigned to a field that is already discovered or may be designated as a new discovery. Wildcat drilling seeks discovery of new accumulations. It may not be

possible to accurately track the productivity of wildcat drilling with only field data because it is not possible to distinguish between field growth and new accumulation discoveries. Consequently, field discovery history can understate wildcat exploration productivity. For this reason, it appears that development of potential analogue models at the play level was most appropriate.

The purpose of this report is to provide assessors with a data base of size-frequency relationships from mature plays that encompass a variety of trap settings and lithologies. Plays presented as potential analogues consist of conventional accumulations, that is, hydrocarbon deposits having a well-defined down-dip oil or gas water contact, from which oil, gas, and NGL can be extracted using traditional development practices. The play data are presented in graphical and tabular form. First, however, a brief description of the data and their suggested application are presented. Then a brief overall summary of the play statistics is provided. The graphical and tabular presentation of the data then follows.

This document is written in support of the Alaska North Slope Assessment. The most recent assessment of the Arctic National Wildlife Refuge 1002 Area (USGS ANWR Assessment Team, 1999) used a 50 million barrel of oil-in place minimum accumulation size cutoff. By 2004, it was apparent that in areas where infrastructure exists, accumulations smaller than that cut-off are of interest. The graphs presented in this report, that can be used for estimating numbers of accumulations in smaller size classes, show a nominal minimum oil accumulation size of 5 million barrels oil equivalent recoverable (100 billion cubic feet gas equivalent recoverable for gas accumulations). The basic size-frequency data are provided in Appendix 1, so the user may choose other minimum accumulation sizes.

Acknowledgments

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Data

Theoretically, an ideal analogue data set would show the size-frequency relationship for the" total" number of accumulations in the play, where the "total" number includes discovered and undiscovered accumulations. In this report, the basic data for the size-frequency relationship for each play consists of an estimate of the total number of oil or gas accumulations at least 1 million barrels of oil or 6 billion cubic feet, recoverable. For each play, the hydrocarbon volumes of discovered accumulations are based on the "appreciated" size. The "appreciated" size of the accumulation is defined as the known recovery (past production plus proved reserves) plus the inferred reserves where inferred reserves are additions to proved reserves that are expected to occur over a given time span. The total accumulation size frequency is the combined size-frequency calculated from the undiscovered assessment and the appreciated size-frequency of the discovered accumulations.

The United States is the most intensely explored and drilled large oil and gas producer in the world. The published results of the1995 National Assessment of Oil and Gas for the United States prepared by the U.S. Geological Survey (Gautier and others, 1996) provide data organized by play from which to estimate the expected numbers of undiscovered accumulations assessed by size category[1]. The assessment of undiscovered accumulations reflects understanding as of January 1, 1994. For each play, the accumulations discovered before January 1,1994 were identified and their known recovery was adjusted to include inferred reserves, that is, reserves expected to be added to the accumulation's known recovery during the productive life of the accumulation. This procedure is discussed in Attanasi and Root (1994) and applied to the reservoir data from the "Significant oil fields in the United States 2000" data base available from NRG Associates[2].

Size-frequency distributions of fully-appreciated discovered and undiscovered accumulations were developed for all the conventional lower 48 plays (with discoveries)[3] that were assessed as part of the 1995 USGS National Assessment. In order to have reasonably stable size-frequency relationships, the plays with at least 50 ultimate accumulations were chosen for display and additional analysis. There were 36 plays with at least 50 oil accumulations and 25 plays with at least 50 gas accumulations (see table 1). Additional data about the primary trapping mechanisms and principal and secondary lithologies are presented in tabular form for each play and are described in summary tables in the next section. For each play a narrative geologic description, the play outline, and references are provided in Gautier and others (1996).

Application of analogue data and description of analogues

Suppose for the assessment of a frontier or high cost play, say play X, the geologist is reasonably confident about

[1] The minimum size accumulation assessed by the geologists at the play level was 1 million barrels of oil or 6 billion cubic feet of gas. The Pareto parameterization used for computing the expected numbers undiscovered accumulations by size category was from Houghton (1988). The assessment data used for computations are from Charpentier and others (1996).

[2] For the 1995 National Assessment, inferred oil and gas resources were projected to the year 2072. New growth factors were calibrated from the NRG data for oil-accumulation and the gas-accumulations and applied to estimate the inferred volumes associated with the NRG Associates estimates.

[3] There were 279 conventional plays that had discoveries in the onshore areas in the lower 48 States.

the number of total accumulations of size at least 50 million barrels of oil equivalent. Further, suppose that the geologist must estimate the number of ultimate accumulations having sizes as small as 5 million barrels and has chosen[4] Play 4411, San Andres-Clearfork, Northwestern and Eastern Shelves, located in the Permian Basin, as the analogue play. Figure 1A shows the estimated ultimate size distribution of this play where the smallest size class is from 1 to 2 million barrels of oil equivalent. Of the 425 oil accumulations represented in Figure 1 there are about 233 that are in size classes of 4-8 million barrels of oil equivalent and larger size. These 233 larger accumulations were used to construct figure 1B.

Figure 1B is the complement of the cumulative size–frequency distribution of accumulations for the play shown in Figure 1A but standardized so that the smallest accumulation is 5 million barrels instead of 1 million barrels. Specifically, the vertical height is the fraction of the total number of oil accumulations in the play that are larger than the size cutoffs shown on the horizontal axis. Suppose the geologist is confident there are at least 10 accumulations of at least 50 million barrels recoverable in the play X which he is assessing. Further, suppose the geologist uses Play 4411 (figure 1B) as the analogue for assessing the total number of accumulations greater than 5 million barrels of oil equivalent and also the number of accumulations between 5 and 50 million barrels in play X. From Figure 1B, he observes that accumulations of sizes of at least 50 million barrels account for about 12 percent of the total number of accumulations that are of at least 5 million barrels. If 10 accumulations represent 12 percent of the total, there are about 83 total accumulations in the assessor's play and he would estimate about 73 accumulations between 50 and 5 million barrels of oil equivalent.

Several play properties that might guide the choice of play analogues include lithology, trapping mechanisms, depth, and hydrocarbon properties. These data are provided for each of the plays (NRG Associates, 2001). Tables 2 and 3 present a compilation of oil and gas accumulations by *primary trapping mechanism*. Tables 4 and 5 present a compilation of the plays by *principal and secondary lithology* as listed by NRG Associates. Table 6 presents the reservoir depth data for the plays and the calculated area of each play. These data along with histograms of the API oil gravity and gas to oil ratios for oil accumulations and liquids to gas ratios for gas accumulations are also presented for each play in its section.

Tables 2 and 3 show the numbers of oil and gas accumulations, respectively, and the associated volumes of resources by play assigned by NRG Associates to the three primary trap types; stratigraphic, structural, and the combination of stratigraphic/structural. Not all accumulations were assigned a trap type by NRG Associates, so the subtotals for each play typically do not add up to 100 percent of the accumulations or the volumes. Overall, for the oil accumulations that were assigned in plays shown in table 1, 51 percent of the oil accumulations (accounting for 73 percent of the oil by volume) were assigned to the combination category. About 25 and 24 percent of the accumulations were assigned to stratigraphic and structural traps (accounting, respectively, for 12 and 15 percent of the oil). Predominantly structural oil plays include play 3402 Basin Margin Anticline, Big Horn Basin, and play 6301 Anticline play of the Michigan Basin. Overall, for the gas accumulations assigned a trap type, 48 percent was assigned to combination traps (containing 62 percent of the gas by volume), 20 percent to stratigraphic traps (containing 7 percent of the gas) and 30 percent was assigned to structural taps (containing 32 percent of the gas). Predominantly structural gas plays include Play 4401– "Pre-Pennsylvanian Delaware Val Verdes;" Permian Basin and Play 4732 –Frio South Texas; Western Gulf.

Table 4 shows the oil and table 5 the gas accumulation numbers and the associated volumes that were assigned by NRG Associates to the principal and secondary reservoir lithology. Sandstone was assigned as the primary lithology for 51 percent of the oil accumulations, accounting for 41 percent of the oil. Sandstone was the primary reservoir lithology for 79 percent of the gas accumulations; accounting for 76 percent of the gas. For both oil and gas, dolomite and limestone account for nearly all other accumulations not assigned to sandstone as the principal lithology. The plays considered here were restricted to conventional oil and gas accumulations, so it is not surprising that few were assigned shale; a reservoir lithology that is typically associated with continuous-type accumulations. .

Table 6 summarizes the observed depth distribution of historical discoveries (NRG Associates, 2001) of the play and the depth distribution for expected future discoveries (Charpentier and others, 1996). The depths of expected future discoveries reflected the assessor's geologic judgment of depths for undiscovered accumulations. Table 6 also provides the computed area extent each play[5].

Summary

The play data in the next sections focus on the petroleum accumulation size-frequency relationships. The other data, including trap type, principal and secondary lithology, gas to oil ratios, gravity and play depth and area were also provided so that the geologists would have other descriptive data available to assist in the choice of an analogue play or plays. Gas to oil ratios and API gravity data for discovered oil accumulations are presented in histograms such as those presented in figures 2A and 2B.

[4] The criteria and procedures for choosing the appropriate analogue play is extremely important but well beyond the scope of this discussion. Practitioners argue it is as much art as science (Coleman, 2004).

[5] Data used in the calculations were taken from http://energy.cr.usgs.gov/oilgas/noga

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Table 1. Analogue plays with at least fifty ultimate (discovered plus mean of undiscovered) oil or gas accumulations.

USGS play number	USGS play name	Province	Region
	Plays containing at least 50 oil accumulations		
1302	Neogene - Onshore	Ventura Basin	Pacific Coast
3101	Madison (Mississippian)	Williston Basin	Rocky Mountain and Northern Great Plains
3102	Red River (Ordovician)	Williston Basin	Rocky Mountain and Northern Great Plains
3103	Middle and Upper Devonian (Pre-Bakken - Post-Prairie Salt)	Williston Basin	Rocky Mountain and Northern Great Plains
3302	Basin Margin Anticline	Powder River Basin	Rocky Mountain and Northern Great Plains
3304	Upper Minnelusa Sandstone	Powder River Basin	Rocky Mountain and Northern Great Plains
3402	Basin Margin Anticline	Big Horn Basin	Rocky Mountain and Northern Great Plains
3905	Dakota Group (Combined J and D Sandstones)	Denver Basin	Rocky Mountain and Northern Great Plains
4402	“Pre-Pennsylvanian, Central Basin Platform”	Permian Basin	West Texas and Eastern New Mexico
4403	“Pre-Pennsylvanian, Northwestern and Eastern Shelves”	Permian Basin	West Texas and Eastern New Mexico
4405	“Horseshoe Atoll, Upper Pennsylvanian - Wolfcampian”	Permian Basin	West Texas and Eastern New Mexico
4406	“Upper Pennsylvanian, Northwestern and Eastern Shelves, Northern Delaware and Midland Basins and Northern Central Basin Platform"	Permian Basin	West Texas and Eastern New Mexico
4407	“Upper Pennsylvanian and Lower Permian Shelf, Slope and Basin Sandstones”	Permian Basin	West Texas and Eastern New Mexico
4410	“San Andres-Clearfork, Central Basin Platform and Ozona Arch”	Permian Basin	West Texas and Eastern New Mexico
4411	“San Andres-Clearfork, Northwestern and Eastern Shelves”	Permian Basin	West Texas and Eastern New Mexico
4412	Delaware Sandstones	Permian Basin	West Texas and Eastern New Mexico
4502	Mississippian Carbonate	Bend Arch-Fort Worth Basin	West Texas and Eastern New Mexico
4504	Lower Pennsylvanian (Bend) Sandstone and Conglomerate	Bend Arch-Fort Worth Basin	West Texas and Eastern New Mexico
4505	Strawn (Desmoinesian)	Bend Arch-Fort Worth Basin	West Texas and Eastern New Mexico
4506	Post-Desmoinesian	Bend Arch-Fort Worth Basin	West Texas and Eastern New Mexico
4701	Houston Salt Dome Flank Oil and Gas	Western Gulf	Gulf Coast
4722	Upper Wilcox Shelf-Edge Gas and Oil	Western Gulf	Gulf Coast
4726	Yegua Updip Fluvial - Deltaic Oil and Gas	Western Gulf	Gulf Coast
4728	Jackson Updip Gas and Oil	Western Gulf	Gulf Coast
4733	Frio South Texas Mid-Dip Oil and Gas	Western Gulf	Gulf Coast
4735	Frio SE Texas/S. Louisiana Mid-Dip Gas and Oil	Western Gulf	Gulf Coast
4912	Smackover Salt Basins Gas and Oil	Louisiana-Mississippi Salt Basins	Gulf Coast
4932	Glen Rose/Rodessa Updip Oil	Louisiana-Mississippi Salt Basins	Gulf Coast
4934	Paluxy Updip Oil	Louisiana-Mississippi Salt Basins	Gulf Coast
4937	Tuscaloosa/Woodbine Structural Oil and Gas	Louisiana-Mississippi Salt Basins	Gulf Coast
4945	Wilcox Salt Basins Oil	Louisiana-Mississippi Salt Basins	Gulf Coast
5305	Pennsylvanian Cyclical Carbonates and Sandstones	Cambridge-Arch Central Kansas	Midcontinent
5816	Morrow Sandstone Gas and Oil Stratigraphic	Anadarko Basin	Midcontinent
6005	Pennsylvanian Stratigraphic	Cherokee Platform	Midcontinent
6301	Anticline	Michigan Basin	Eastern
6307	Northern Niagaran Reef	Michigan Basin	Eastern

Table 1. Analogue plays with at least fifty ultimate (discovered plus mean of undiscovered) oil or gas accumulations.—Continued

USGS play number	USGS play name	Province	Region
	Plays containing at least 50 gas accumulations		
903	Western Winters through Domingene	Sacramento Basin	Pacific Coast
4401	“Pre-Pennsylvanian, Delaware - Val Verde Basins”	Permian Basin	West Texas and Eastern New Mexico
4404	Lower Pennsylvanian (Bend) Sandstone	Permian Basin	West Texas and Eastern New Mexico
4406	“Upper Pennsylvanian, Northwestern and Eastern Shelves, Northern Delaware and Midland Basins and Northern Central Basin Platform"	Permian Basin	West Texas and Eastern New Mexico
4407	“Upper Pennsylvanian and Lower Permian Shelf, Slope and Basin Sandstones”	Permian Basin	West Texas and Eastern New Mexico
4410	“San Andres-Clearfork, Central Basin Platform and Ozona Arch”	Permian Basin	West Texas and Eastern New Mexico
4504	Lower Pennsylvanian (Bend) Sandstone and Conglomerate	Bend Arch-Fort Worth Basin	West Texas and Eastern New Mexico
4718	Lower Wilcox Lobo Gas	Western Gulf	Gulf Coast
4719	Lower Wilcox Fluvial Oil and Gas	Western Gulf	Gulf Coast
4722	Upper Wilcox Shelf-Edge Gas and Oil	Western Gulf	Gulf Coast
4723	Upper Wilcox Downdip Overpressured Gas	Western Gulf	Gulf Coast
4726	Yegua Updip Fluvial - Deltaic Oil and Gas	Western Gulf	Gulf Coast
4727	Yegua Downdip Gas	Western Gulf	Gulf Coast
4731	Vicksburg Downdip Gas	Western Gulf	Gulf Coast
4732	Frio South Texas Downdip Gas	Western Gulf	Gulf Coast
4733	Frio South Texas Mid-Dip Oil and Gas	Western Gulf	Gulf Coast
4734	Frio Updip Fluvial Gas and Oil	Western Gulf	Gulf Coast
4735	Frio SE Texas/S. Louisiana Mid-Dip Gas and Oil	Western Gulf	Gulf Coast
4736	Frio SE Texas/S. Louisiana Downdip Gas	Western Gulf	Gulf Coast
4739	Lower Miocene Fluvial Sandstone Oil and Gas	Western Gulf	Gulf Coast
4912	Smackover Salt Basins Gas and Oil	Louisiana-Mississippi Salt Basins	Gulf Coast
4926	Hosston/Travis Peak Salt Basins Gas	Louisiana-Mississippi Salt Basins	Gulf Coast
4933	Glen Rose/Rodessa Salt Basins Gas	Louisiana-Mississippi Salt Basins	Gulf Coast
5816	Morrow Sandstone Gas and Oil Stratigraphic	Anadarko Basin	Midcontinent
6307	Northern Niagaran Reef	Michigan Basin	Eastern

Table 2. Numbers of discovered oil accumulations and volume of known oil recovery by major trap type. (Not all accumulations attributed for trap type, so subtotal may be less than 100%).

[Data are from NRG Associates (2001)]

USGS Play Number	Trap type	Oil Accumulations Number	Oil Accumulations Percent of Play	Oil Volume MMBO	Oil Volume Percent of Play
Play 1302 – Neogene - Onshore; Ventura Basin					
1302	combination	43	71.7	1,879	91.8
1302	stratigraphic	5	8.3	12	0.6
1302	structural	12	20	156	7.6
PLAY SUBTOTAL		60	100	2,048	100
Play 3101 – Madison (Mississippian); Williston Basin					
3101	combination	60	46.9	663	63.6
3101	stratigraphic	23	18	174	16.7
3101	structural	8	6.2	125	12
PLAY SUBTOTAL		91	71.1	962	92.3
Play 3102 – Red River (Ordovician); Williston Basin					
3102	combination	51	68.9	219	77.4
3102	stratigraphic	0	0	0	0
3102	structural	3	4.1	15	5.1
PLAY SUBTOTAL		54	73	233	82.5
Play 3103 – Middle and Upper Devonian (Pre-Bakken - Post-Prairie Salt); Williston Basin					
3103	combination	26	53.1	70	36.5
3103	stratigraphic	2	4.1	6	2.9
3103	structural	3	6.1	84	43.5
PLAY SUBTOTAL		31	63.3	160	82.9
Play 3302 – Basin Margin Anticline; Powder River Basin					
3302	combination	31	66	984	85
3302	stratigraphic	3	6.4	6	0.5
3302	structural	13	27.7	168	14.5
PLAY SUBTOTAL		47	100	1,158	100
Play 3304 – Upper Minnelusa Sandstone; Powder River Basin					
3304	combination	28	22.8	135	24.1
3304	stratigraphic	92	74.8	422	75.1
3304	structural	0	0	0	0
PLAY SUBTOTAL		120	97.6	557	99.2
Play 3402 – Basin Margin Anticline; Big Horn Basin					
3402	combination	12	14.6	61	2.3
3402	stratigraphic	0	0	0	0
3402	structural	69	84.1	2,529	97.6
PLAY SUBTOTAL		81	98.7	2,590	99.9
Play 3905 – Dakota Group (Combined J and D Sandstones); Denver Basin					
3905	combination	107	48.2	372	57.8
3905	stratigraphic	75	33.8	198	30.7
3905	structural	12	5.4	34	5.3
PLAY SUBTOTAL		194	87.4	604	93.8

Table 2. Numbers of discovered oil accumulations and volume of known oil recovery by major trap type. (Not all accumulations attributed for trap type, so subtotal may be less than 100%).—Continued

USGS Play Number	Trap type	Oil Accumulations Number	Oil Accumulations Percent of Play	Oil Volume MMBO	Oil Volume Percent of Play
Play 4402 – "Pre-Pennsylvanian, Central Basin Platform"; Permian Basin					
4402	combination	102	44.7	1,414	43.9
4402	stratigraphic	7	3.1	51	1.6
4402	structural	112	49.1	1,739	54
PLAY SUBTOTAL		221	96.9	3,203	99.5
Play 4403 – "Pre-Pennsylvanian, Northwestern and Eastern Shelves;" Permian Basin					
4403	combination	61	44.9	547	54.9
4403	stratigraphic	8	5.9	59	5.9
4403	structural	48	35.3	316	31.7
PLAY SUBTOTAL		117	86.1	922	92.5
Play 4405 – "Horseshoe Atoll, Upper Pennsylvanian – Wolfcampian;" Permian Basin					
4405	combination	1	1.7	2	0.1
4405	stratigraphic	58	98.3	2,833	99.9
4405	structural	0	0	0	0
PLAY SUBTOTAL		59	100	2,835	100
Play 4406 – "Upper Pennsylvanian, Northwestern and Eastern Shelves, Northern Delaware and Midland Basins and Northern Central Basin Platform;" Permian Basin					
4406	combination	122	44.2	888	55.5
4406	stratigraphic	91	33	589	36.8
4406	structural	29	10.5	78	4.8
PLAY SUBTOTAL		242	87.7	1,555	97.1
Play 4407 – "Upper Pennsylvanian and Lower Permian Shelf, Slope and Basin Sandstones;" Permian Basin					
4407	combination	19	37.3	102	48.1
4407	stratigraphic	26	51	104	48.8
4407	structural	2	3.9	2	1
PLAY SUBTOTAL		47	92.2	208	97.9
Play 4410 – "San Andres-Clearfork, Central Basin Platform and Ozona Arch;" Permian Basin					
4410	combination	226	83.4	12,008	99
4410	stratigraphic	9	3.3	37	0.3
4410	structural	23	8.5	56	0.5
PLAY SUBTOTAL		258	95.2	12,101	99.8
Play 4411 – "San Andres-Clearfork, Northwestern and Eastern Shelves;" Permian Basin					
4411	combination	191	52.5	9,372	88.3
4411	stratigraphic	97	26.6	1,012	9.5
4411	structural	28	7.7	129	1.2
PLAY SUBTOTAL		316	86.8	10,513	99
Play 4412 – Delaware Sandstones; Permian Basin					
4412	combination	46	42.2	238	51.1
4412	stratigraphic	26	23.9	135	29
4412	structural	1	0.9	3	0.6
PLAY SUBTOTAL		73	67	375	80.7

Table 2. Numbers of discovered oil accumulations and volume of known oil recovery by major trap type. (Not all accumulations attributed for trap type, so subtotal may be less than 100%).—Continued

USGS Play Number	Trap type	Oil Accumulations Number	Oil Accumulations Percent of Play	Oil Volume MMBO	Oil Volume Percent of Play
Play 4502 – Mississippian Carbonate; Bend Arch-Ft. Worth Basin					
4502	combination	12	25.5	21	23.4
4502	stratigraphic	23	48.9	46	50
4502	structural	7	14.9	18	20.1
PLAY SUBTOTAL		42	89.3	86	93.5
Play 4504 – Lower Pennsylvanian (Bend) Sandstone and Conglomerate; Bend Arch-Ft. Worth Basin					
4504	combination	36	41.4	119	54.9
4504	stratigraphic	10	11.5	29	13.7
4504	structural	28	32.2	58	26.8
PLAY SUBTOTAL		74	85.1	206	95.4
Play 4505 – Strawn (Desmoinesian); Bend Arch-Ft. Worth Basin					
4505	combination	172	58.7	1,244	78.8
4505	stratigraphic	46	15.7	133	8.4
4505	structural	59	20.1	180	11.4
PLAY SUBTOTAL		277	94.5	1,557	98.6
Play 4506 – Post-Desmoinesian; Bend Arch-Ft. Worth Basin					
4506	combination	56	51.9	165	47.4
4506	stratigraphic	37	34.3	118	34
4506	structural	9	8.3	56	16
PLAY SUBTOTAL		102	94.5	339	97.4
Play 4701 – Houston Salt Dome Flank Oil and Gas; Western Gulf					
4701	combination	34	69.4	3,462	97.9
4701	stratigraphic	0	0	0	0
4701	structural	11	22.4	63	1.8
PLAY SUBTOTAL		45	91.8	3,525	99.7
Play 4722 – Upper Wilcox Shelf-Edge Gas and Oil; Western Gulf					
4722	combination	24	36.9	108	39.7
4722	stratigraphic	0	0	0	0
4722	structural	32	49.2	154	56.8
PLAY SUBTOTAL		56	86.1	261	96.5
Play 4726 – Yegua Updip Fluvial - Deltaic Oil and Gas; Western Gulf					
4726	combination	44	44.9	264	71.2
4726	stratigraphic	10	10.2	14	3.8
4726	structural	31	31.6	72	19.4
PLAY SUBTOTAL		85	86.7	350	94.4
Play 4728 – Jackson Updip Gas and Oil; Western Gulf					
4728	combination	54	54	520	70.7
4728	stratigraphic	26	26	165	22.4
4728	structural	18	18	48	6.6
PLAY SUBTOTAL		98	98	734	99.7

Table 2. Numbers of discovered oil accumulations and volume of known oil recovery by major trap type. (Not all accumulations attributed for trap type, so subtotal may be less than 100%).—Continued

USGS Play Number	Trap type	Oil Accumulations Number	Oil Accumulations Percent of Play	Oil Volume MMBO	Oil Volume Percent of Play
Play 4733 – Frio South Texas Mid-Dip Oil and Gas; Western Gulf					
4733	combination	81	44.3	1,879	70.8
4733	stratigraphic	4	2.2	12	0.5
4733	structural	79	43.2	724	27.3
PLAY SUBTOTAL		164	89.7	2,615	98.6
Play 4735 – Frio SE Texas/S. Louisiana Mid-Dip Gas and Oil; Western Gulf					
4735	combination	45	42.1	874	80.6
4735	stratigraphic	0	0	0	0
4735	structural	43	40.2	179	16.4
PLAY SUBTOTAL		88	82.3	1,053	97
Play 4912 – Smackover Salt Basins Gas and Oil; Louisiana-Mississippi Salt Basins					
4912	combination	19	33.9	318	56.6
4912	stratigraphic	3	5.4	45	8
4912	structural	28	50	175	31.1
PLAY SUBTOTAL		50	89.3	538	95.7
Play 4932 – Glen Rose/Rodessa Updip Oil; Louisiana-Mississippi Salt Basins					
4932	combination	37	56.9	486	79.3
4932	stratigraphic	8	12.3	34	5.6
4932	structural	17	26.2	89	14.5
PLAY SUBTOTAL		62	95.4	609	99.4
Play 4934 – Paluxy Updip Oil; Louisiana-Mississippi Salt Basins					
4934	combination	27	41.5	691	84.9
4934	stratigraphic	2	3.1	4	0.5
4934	structural	32	49.2	112	13.8
PLAY SUBTOTAL		61	93.8	808	99.2
Play 4937 – Tuscaloosa/Woodbine Structural Oil and Gas; Louisiana-Mississippi Salt Basins					
4937	combination	37	51.4	1,955	80.1
4937	stratigraphic	6	8.3	25	1
4937	structural	25	34.7	455	18.7
PLAY SUBTOTAL		68	94.4	2,434	99.8
Play 4945 – Wilcox Salt Basins Oil; Louisiana-Mississippi Salt Basins					
4945	combination	70	47.6	320	58.7
4945	stratigraphic	15	10.2	57	10.4
4945	structural	48	32.7	142	26
PLAY SUBTOTAL		133	90.5	519	95.1
Play 5305 – Pennsylvanian Cyclical Carbonates and Sandstones; Cambridge Arch-Central Kansas					
5305	combination	14	24.6	53	33.5
5305	stratigraphic	1	1.8	1	0.8
5305	structural	12	21.1	33	21.2
PLAY SUBTOTAL		27	47.5	87	55.5

Table 2. Numbers of discovered oil accumulations and volume of known oil recovery by major trap type. (Not all accumulations attributed for trap type, so subtotal may be less than 100%).—Continued

USGS Play Number	Trap type	Oil Accumulations Number	Oil Accumulations Percent of Play	Oil Volume MMBO	Oil Volume Percent of Play
Play 5816 – Morrow Sandstone Gas and Oil Stratigraphic; Anadarko Basin					
5816	combination	9	18.8	74	43.5
5816	stratigraphic	17	35.4	45	26.6
5816	structural	2	4.2	14	8.4
PLAY SUBTOTAL		28	58.4	133	78.5
Play 6005 – Pennsylvanian Stratigraphic; Cherokee Basin					
6005	combination	1	2	1	0.3
6005	stratigraphic	31	63.3	208	80.9
6005	structural	0	0	0	0
PLAY SUBTOTAL		32	65.3	209	81.2
Play 6301 – Anticline; Michigan Basin					
6301	combination	8	10.4	75	13.5
6301	stratigraphic	1	1.3	2	0.4
6301	structural	44	57.1	398	71.6
PLAY SUBTOTAL		53	68.8	476	85.5
Play 6307 – Northern Niagaran Reef; Michigan Basin					
6307	combination	0	0	0	0
6307	stratigraphic	177	100	325	100
6307	structural	0	0	0	0
PLAY SUBTOTAL		177	100	325	100

Table 3. Numbers of discovered gas accumulations and volume of known gas recovery by major trap type. (Not all accumulations attributed for trap type, so subtotal may be less than 100%).

[Data are from NRG Associates (2001)]

USGS Play Number	Trap type	Gas Accumulations Number	Gas Accumulations Percent of Play	Gas Volume BCF	Gas Volume Percent of Play
Play 903 – Western Winters through Domingene; Sacramento Basin					
903	combination	27	47.4	5,692	79.8
903	stratigraphic	4	7	132	1.8
903	structural	22	38.6	1,254	17.6
PLAY SUBTOTAL		53	93	7,077	99.2
Play 4401 – "Pre-Pennsylvanian, Delaware - Val Verde Basins;" Permian Basin					
4401	combination	7	6.5	539	2.3
4401	structural	82	76.6	22,055	95.7
PLAY SUBTOTAL		89	83.1	22,594	98
Play 4404 – Lower Pennsylvanian (Bend) Sandstone; Permian Basin					
4404	combination	44	30.1	2,960	46.2
4404	stratigraphic	43	29.5	2,076	32.4
4404	structural	5	3.4	73	1.1
PLAY SUBTOTAL		92	63	5,108	79.7
Play 4406 – "Upper Pennsylvanian, Northwestern and Eastern Shelves, Northern Delaware and Midland Basins and Northern Central Basin Platform;" Permian Basin					
4406	combination	21	42	2,814	70.6
4406	stratigraphic	17	34	944	23.7
4406	structural	2	4	73	1.8
PLAY SUBTOTAL		40	80	3,832	96.1
Play 4407 – "Upper Pennsylvanian and Lower Permian Shelf, Slope and Basin Sandstones;" Permian Basin					
4407	combination	31	36.5	5,250	70.1
4407	stratigraphic	29	34.1	1,335	17.8
4407	structural	9	10.6	276	3.7
PLAY SUBTOTAL		69	81.2	6,861	91.6
Play 4410 – "San Andres–Clearfork, Central Basin Platform and Ozona Arch;" Permian Basin					
4410	combination	38	76	9,133	98.5
4410	stratigraphic	3	6	27	0.3
4410	structural	1	2	8	0.1
PLAY SUBTOTAL		42	84	9,168	98.9
Play 4504 – Lower Pennsylvanian (Bend) Sandstone and Conglomerate; Bend Arch–Ft. Worth Basin					
4504	combination	42	36.2	4,168	77
4504	stratigraphic	22	19	341	6.3
4504	structural	14	12.1	256	4.7
PLAY SUBTOTAL		78	67.3	4,765	88
Play 4718 – Lower Wilcox Lobo Gas; Western Gulf					
4718	combination	9	12.9	2,217	21.4
4718	structural	29	41.4	6,995	67.6
PLAY SUBTOTAL		38	54.3	9,213	89

Table 3. Numbers of discovered gas accumulations and volume of known gas recovery by major trap type. (Not all accumulations attributed for trap type, so subtotal may be less than 100%).—Continued

USGS Play Number	Trap type	Gas Accumulations Number	Gas Accumulations Percent of Play	Gas Volume BCF	Gas Volume Percent of Play
Play 4719 – Lower Wilcox Fluvial Oil and Gas; Western Gulf					
4719	combination	16	33.3	1,623	69.6
4719	stratigraphic	1	2.1	35	1.5
4719	structural	10	20.8	140	6
PLAY SUBTOTAL		27	56.2	1,799	77.1
Play 4722 – Upper Wilcox Shelf–Edge Gas and Oil; Western Gulf					
4722	combination	81	28.4	6,237	45.8
4722	stratigraphic	4	1.4	48	0.4
4722	structural	132	46.3	4,860	35.7
PLAY SUBTOTAL		217	76.1	11,146	81.9
Play 4723 – Upper Wilcox Downdip Overpressured Gas; Western Gulf					
4723	combination	16	18.2	583	11.4
4723	stratigraphic	1	1.1	7	0.1
4723	structural	40	45.5	3,327	65
PLAY SUBTOTAL		57	64.8	3,917	76.5
Play 4726 – Yegua Updip Fluvial – Deltaic Oil and Gas; Western Gulf					
4726	combination	29	33	934	40.2
4726	stratigraphic	3	3.4	51	2.2
4726	structural	26	29.5	741	31.9
PLAY SUBTOTAL		58	65.9	1,726	74.3
Play 4727 – Yegua Downdip Gas; Western Gulf					
4727	combination	15	24.6	381	25.5
4727	stratigraphic	1	1.6	6	0.4
4727	structural	16	26.2	335	22.4
PLAY SUBTOTAL		32	52.4	721	48.3
Play 4731 – Vicksburg Downdip Gas; Western Gulf					
4731	combination	40	38.1	6,727	73.9
4731	stratigraphic	2	1.9	125	1.4
4731	structural	32	30.5	877	9.6
PLAY SUBTOTAL		74	70.5	7,729	84.9
Play 4732 – Frio South Texas Downdip Gas; Western Gulf					
4732	combination	4	9.3	52	2.2
4732	structural	24	55.8	1,642	68.7
PLAY SUBTOTAL		28	65.1	1,694	70.9
Play 4733 – Frio South Texas Mid–Dip Oil and Gas; Western Gulf					
4733	combination	92	30.6	18,131	69
4733	stratigraphic	3	1	175	0.7
4733	structural	140	46.5	6,153	23.4
PLAY SUBTOTAL		235	78.1	24,459	93.1
Play 4734 – Frio Updip Fluvial Gas and Oil; Western Gulf					
4734	combination	23	37.1	878	47.9
4734	stratigraphic	4	6.5	39	2.1
4734	structural	20	32.3	623	34
PLAY SUBTOTAL		47	75.9	1,539	84

Table 3. Numbers of discovered gas accumulations and volume of known gas recovery by major trap type. (Not all accumulations attributed for trap type, so subtotal may be less than 100%).—Continued

USGS Play Number	Trap type	Gas Accumulations Number	Gas Accumulations Percent of Play	Gas Volume BCF	Gas Volume Percent of Play
Play 4735 – Frio SE Texas/S. Louisiana Mid–Dip Gas and Oil; Western Gulf					
4735	combination	38	33.3	4,043	62.5
4735	structural	47	41.2	1,916	29.6
PLAY SUBTOTAL		85	74.5	5,958	92.1
Play 4736 – Frio SE Texas/S. Louisiana Downdip Gas; Western Gulf					
4736	combination	19	27.9	2,513	59.3
4736	structural	31	45.6	1,409	33.2
PLAY SUBTOTAL		50	73.5	3,922	92.5
Play 4739 – Lower Miocene Fluvial Sandstone Oil and Gas; Western Gulf					
4739	combination	36	48.6	1,335	56
4739	structural	30	40.5	948	39.8
PLAY SUBTOTAL		66	89.1	2,283	95.8
Play 4912 – Smackover Salt Basins Gas and Oil; Louisiana–Mississippi Salt Basins					
4912	combination	24	47.1	902	55.7
4912	stratigraphic	1	2	35	2.2
4912	structural	22	43.1	632	39
PLAY SUBTOTAL		47	92.2	1,569	96.9
Play 4926 – Hosston/Travis Peak Salt Basins Gas; Louisiana–Mississippi Salt Basins					
4926	combination	23	51.1	2,341	69.6
4926	stratigraphic	5	11.1	107	3.2
4926	structural	13	28.9	702	20.9
PLAY SUBTOTAL		41	91.1	3,150	93.7
Play 4933 – Glen Rose/Rodessa Salt Basins Gas; Louisiana–Mississippi Salt Basins					
4933	combination	46	58.2	3,569	85.1
4933	stratigraphic	11	13.9	158	3.8
4933	structural	18	22.8	410	9.8
PLAY SUBTOTAL		75	94.9	4,137	98.7
Play 5816 – Morrow Sandstone Gas and Oil Stratigraphic; Anadarko Basin					
5816	combination	41	25.8	3,675	52.9
5816	stratigraphic	85	53.5	2,790	40.2
5816	structural	2	1.3	13	0.2
PLAY SUBTOTAL		128	80.6	6,479	93.3
Play 6307 – Northern Niagaran Reef; Michigan Basin					
6307	stratigraphic	78	100	848	100
PLAY TOTAL		78	100	848	100

Table 4. Numbers of discovered oil accumulations and volume of known oil recovery by principal and secondary lithology.

[Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Oil Accumulations Number	Oil Accumulations Percent of Play	Oil Volume MMBO	Oil Volume Percent of Play
Play 1302 – Neogene - Onshore; Ventura Basin						
1302	sandstone		56	93.3	2,010	98.2
1302	sandstone	shale	4	6.7	38	1.8
PLAY TOTAL			60	100	2,048	100
Play 3101 – Madison (Mississippian); Williston Basin						
3101	carbonate		2	1.6	11	1.1
3101	dolomite	limestone	10	7.8	115	11
3101	dolomite		8	6.2	155	14.9
3101	limestone	anhydrite	1	0.8	48	4.6
3101	limestone	dolomite	16	12.5	102	9.8
3101	limestone		91	71.1	611	58.6
PLAY TOTAL			128	100	1,042	100
Play 3102 – Red River (Ordovician); Williston Basin						
3102	dolomite	limestone	9	12.2	49	17.4
3102	dolomite		65	87.8	233	82.6
PLAY TOTAL			74	100	282	100
Play 3103 – Middle and Upper Devonian (Pre-Bakken - Post-Prairie Salt); Williston Basin						
3103	dolomite	limestone	12	24.5	104	54.1
3103	dolomite		29	59.2	74	38.3
3103	limestone	dolomite	2	4.1	4	2.3
3103	limestone		6	12.2	10	5.3
PLAY TOTAL			49	100	193	100
Play 3302 – Basin Margin Anticline; Powder River Basin						
3302	dolomite		1	2.1	2	0.1
3302	limestone	dolomite	1	2.1	2	0.2
3302	sandstone	dolomite	2	4.3	70	6.1
3302	sandstone		42	89.4	1,077	93
3302	shale		1	2.1	7	0.6
PLAY TOTAL			47	100	1,158	100
Play 3304 – Upper Minnelusa Sandstone; Powder River Basin						
3304	sandstone	dolomite	5	4.1	41	7.3
3304	sandstone		118	95.9	521	92.7
PLAY TOTAL			123	100	562	100
Play 3402 – Basin Margin Anticline; Big Horn Basin						
3402	dolomite	limestone	5	6.1	196	7.6
3402	dolomite		15	18.3	309	11.9
3402	dolomite	sandstone	4	4.9	16	0.6
3402	limestone	dolomite	2	2.4	14	0.5
3402	limestone		10	12.2	228	8.8
3402	limestone	sandstone	4	4.9	486	18.7
3402	sandstone	dolomite	2	2.4	371	14.3
3402	sandstone		40	48.8	971	37.5
PLAY TOTAL			82	100	2,591	100

Table 4. Numbers of discovered oil accumulations and volume of known oil recovery by principal and secondary lithology. —Continued

USGS Play Number	Primary Lithology	Secondary Lithology	Oil Accumulations Number	Oil Accumulations Percent of Play	Oil Volume MMBO	Oil Volume Percent of Play
Play 3905 – Dakota Group (Combined J and D Sandstones); Denver Basin						
3905	sandstone		220	100	630	97.9
3905	sandstone	shale	2	0.9	13	2.1
PLAY TOTAL			222	100	643	100
Play 4402 – "Pre-Pennsylvanian, Central Basin Platform;" Permian Basin						
4402	carbonate		1	0.4	2	0.1
4402	chert	dolomite	3	1.3	129	4
4402	chert	limestone	7	3.1	305	9.5
4402	chert		7	3.1	17	0.5
4402	conglomerate	shale	1	0.4	29	0.9
4402	dolomite	chert	13	5.7	217	6.7
4402	dolomite	limestone	25	11	657	20.4
4402	dolomite		92	40.4	910	28.3
4402	dolomite	sandstone	2	0.9	186	5.8
4402	granite wash	conglomerate	1	0.4	9	0.3
4402	limestone	chalk	1	0.4	31	1
4402	limestone	chert	20	8.8	223	6.9
4402	limestone	dolomite	14	6.1	286	8.9
4402	limestone		20	8.8	48	1.5
4402	sandstone	dolomite	1	0.4	10	0.3
4402	sandstone		20	8.8	159	4.9
PLAY TOTAL			228	100	3,218	100
Play 4403 – "Pre-Pennsylvanian, Northwestern and Eastern Shelves;" Permian Basin						
4403	carbonate		4	2.9	30	3
4403	chert	limestone	1	0.7	6	0.6
4403	chert		1	0.7	1	0
4403	dolomite	chert	2	1.5	5	0.5
4403	dolomite	limestone	15	11	224	22.5
4403	dolomite		90	66.2	653	65.6
4403	dolomite	sandstone	1	0.7	5	0.5
4403	limestone	chert	1	0.7	2	0.2
4403	limestone	dolomite	6	4.4	28	2.8
4403	limestone		12	8.8	22	2.2
4403	sandstone	dolomite	1	0.7	7	0.7
4403	sandstone		2	1.5	13	1.3
PLAY TOTAL			136	100	996	100
Play 4405 – "Horseshoe Atoll, Upper Pennsylvanian – Wolfcampian;" Permian Basin						
4405	limestone	dolomite	3	5.1	130	4.6
4405	limestone		49	83.1	2,393	84.4
4405	limestone	sandstone	1	1.7	269	9.5
4405	sandstone	limestone	4	6.8	27	1
4405	sandstone		2	3.4	17	0.6
PLAY TOTAL			59	100	2,835	100

Table 4. Numbers of discovered oil accumulations and volume of known oil recovery by principal and secondary lithology. —Continued

USGS Play Number	Primary Lithology	Secondary Lithology	Oil Accumulations Number	Oil Accumulations Percent of Play	Oil Volume MMBO	Oil Volume Percent of Play
Play 4406 – "Upper Pennsylvanian, Northwestern and Eastern Shelves, Northern Delaware and Midland Basins and Northern Central Basin Platform;" Permian Basin						
4406	chert	limestone	1	0.4	24	1.5
4406	chert		1	0.4	4	0.2
4406	conglomerate	chert	1	0.4	1	0.1
4406	conglomerate	limestone	1	0.4	0	0
4406	conglomerate		2	0.7	2	0.1
4406	dolomite	limestone	2	0.7	12	0.7
4406	dolomite		6	2.2	83	5.2
4406	limestone	chalk	2	0.7	2	0.1
4406	limestone	chert	2	0.7	8	0.5
4406	limestone	conglomerate	1	0.4	1	0.1
4406	limestone	dolomite	7	2.5	112	7
4406	limestone		174	63	1,018	63.6
4406	limestone	sandstone	19	6.9	75	4.7
4406	sandstone	conglomerate	1	0.4	2	0.1
4406	sandstone	limestone	6	2.2	25	1.6
4406	sandstone		50	18.1	233	14.6
PLAY TOTAL			276	100	1,602	100
Play 4407 – "Upper Pennsylvanian and Lower Permian Shelf, Slope and Basin Sandstones;" Permian Basin						
4407	conglomerate		1	2	2	0.9
4407	dolomite	sandstone	1	2	2	0.8
4407	limestone	conglomerate	1	2	9	4.4
4407	limestone	dolomite	1	2	1	0.3
4407	limestone		16	31.4	132	62.3
4407	limestone	sandstone	5	9.8	12	5.5
4407	sandstone	limestone	2	3.9	9	4.1
4407	sandstone		24	47.1	46	21.6
PLAY TOTAL			51	100	212	100
Play 4410 – "San Andres-Clearfork, Central Basin Platform and Ozona Arch;" Permian Basin						
4410	chert	limestone	1	0.4	1	0
4410	dolomite	anhydrite	2	0.7	795	6.6
4410	dolomite	dolomite	1	0.4	11	0.1
4410	dolomite	limestone	38	14	2,862	23.6
4410	dolomite		96	35.4	1,901	15.7
4410	dolomite	sandstone	30	11.1	1,428	11.8
4410	dolomite	shale	1	0.4	6	0
4410	dolomite	siltstone	1	0.4	17	0.1
4410	limestone	chert	1	0.4	13	0.1
4410	limestone	dolomite	15	5.5	3,331	27.5
4410	limestone		23	8.5	194	1.6
4410	limestone	sandstone	3	1.1	959	7.9
4410	sandstone	dolomite	14	5.2	152	1.3
4410	sandstone	limestone	7	2.6	23	0.2
4410	sandstone		34	12.5	359	3
4410	sandstone	sandstone	1	0.4	9	0.1
4410	sandstone	shale	2	0.7	11	0.1
4410	sandstone	siltstone	1	0.4	56	0.5
PLAY TOTAL			271	100	12,127	100

Table 4. Numbers of discovered oil accumulations and volume of known oil recovery by principal and secondary lithology. —Continued

USGS Play Number	Primary Lithology	Secondary Lithology	Oil Accumulations Number	Oil Accumulations Percent of Play	Oil Volume MMBO	Oil Volume Percent of Play
Play 4411 – "San Andres-Clearfork, Northwestern and Eastern Shelves;" Permian Basin						
4411	dolomite	anhydrite	14	3.8	167	1.6
4411	dolomite	dolomite	2	0.5	15	0.1
4411	dolomite	limestone	30	8.2	5,745	54.1
4411	dolomite		108	29.7	1,785	16.8
4411	dolomite	sandstone	20	5.5	653	6.2
4411	limestone	dolomite	17	4.7	376	3.5
4411	limestone	limestone	1	0.3	2	0
4411	limestone		77	21.2	348	3.3
4411	limestone	sandstone	4	1.1	17	0.2
4411	sandstone	anhydrite	2	0.5	7	0.1
4411	sandstone	dolomite	20	5.5	1,146	10.8
4411	sandstone	limestone	1	0.3	5	0
4411	sandstone		68	18.7	349	3.3
PLAY TOTAL			364	100	10,613	100
Play 4412 – Delaware Sandstones; Permian Basin						
4412	dolomite		3	2.8	19	4
4412	limestone		3	2.8	6	1.3
4412	sandstone	dolomite	1	0.9	2	0.4
4412	sandstone	limestone	3	2.8	8	1.7
4412	sandstone		99	90.8	431	92.7
PLAY TOTAL			109	100	465	100
Play 4502 – Mississippian Carbonate; Bend Arch-Ft. Worth Basin						
4502	dolomite	limestone	3	6.4	5	4.9
4502	dolomite		2	4.3	6	6.7
4502	limestone	chert	1	2.1	7	7.9
4502	limestone	dolomite	8	17	14	15.1
4502	limestone		33	70.2	60	65.4
PLAY TOTAL			47	100	92	100
Play 4504 – Lower Pennsylvanian (Bend) Sandstone and Conglomerate; Bend Arch-Ft. Worth Basin						
4504	conglomerate	limestone	2	2.3	1	0.4
4504	conglomerate		49	56.3	150	69.4
4504	conglomerate	sandstone	9	10.3	32	14.8
4504	limestone		8	9.2	10	4.5
4504	sandstone	conglomerate	2	2.3	2	0.7
4504	sandstone		17	19.5	22	10.3
PLAY TOTAL			87	100	216	100
Play 4505 – Strawn (Desmoinesian); Bend Arch-Ft. Worth Basin						
4505	conglomerate	limestone	11	3.8	22	1.4
4505	conglomerate		13	4.4	33	2.1
4505	conglomerate	sandstone	3	1	4	0.3
4505	granite wash		1	0.3	2	0.1
4505	limestone	conglomerate	6	2	33	2.1
4505	limestone		50	17.1	92	5.9
4505	limestone	sandstone	11	3.8	108	6.9
4505	sandstone	conglomerate	1	0.3	81	5.2
4505	sandstone	limestone	10	3.4	296	18.7
4505	sandstone		185	63.1	899	57
4505	sandstone	shale	2	0.7	8	0.5
PLAY TOTAL			293	100	1,578	100

Table 4. Numbers of discovered oil accumulations and volume of known oil recovery by principal and secondary lithology. —Continued

USGS Play Number	Primary Lithology	Secondary Lithology	Oil Accumulations Number	Oil Accumulations Percent of Play	Oil Volume MMBO	Oil Volume Percent of Play
Play 4506 – Post-Desmoinesian; Bend Arch-Ft. Worth Basin						
4506	granite wash	conglomerate	1	0.9	3	0.8
4506	limestone		21	19.4	91	26.2
4506	limestone	sandstone	6	5.6	15	4.2
4506	sandstone	limestone	9	8.3	28	7.9
4506	sandstone		70	64.8	210	60.5
4506	sandstone	shale	1	0.9	1	0.4
PLAY TOTAL			108	100	348	100
Play 4701 – Houston Salt Dome Flank Oil and Gas; Western Gulf						
4701	limestone	sandstone	2	4.1	47	1.3
4701	sandstone		47	95.9	3,490	98.7
PLAY TOTAL			49	100	3,537	100
Play 4722 – Upper Wilcox Shelf-Edge Gas and Oil; Western Gulf						
4722	sandstone		65	100	271	100
PLAY TOTAL			65	100	271	100
Play 4726 – Yegua Updip Fluvial - Deltaic Oil and Gas; Western Gulf						
4726	sandstone		97	99	369	99.4
4726	sandstone	siltstone	1	1	2	0.6
PLAY TOTAL			98	100	371	100
Play 4728 – Jackson Updip Gas and Oil; Western Gulf						
4728	sandstone		98	98	711	96.5
4728	sandstone	shale	2	2	26	3.5
PLAY TOTAL			100	100	736	100
Play 4733 – Frio South Texas Mid-Dip Oil and Gas; Western Gulf						
4733	sandstone		180	98.4	2,631	100
4733	sandstone	shale	2	1.1	22	0.8
4733	shale		1	0.5	1	0
PLAY TOTAL			183	100	2,654	100
Play 4735 – Frio SE Texas/S. Louisiana Mid-Dip Gas and Oil; Western Gulf						
4735	sandstone		107	100	1,086	100
PLAY TOTAL			107	100	1,086	100
Play 4912 – Smackover Salt Basins Gas and Oil; Louisiana-Mississippi Salt Basins						
4912	dolomite	anhydrite	1	1.8	2	0.3
4912	dolomite	limestone	2	3.6	2	0.4
4912	limestone	dolomite	2	3.6	4	0.7
4912	limestone		50	89.3	552	98.2
4912	limestone	sandstone	1	1.8	2	0.4
PLAY TOTAL			56	100	562	100

Table 4. Numbers of discovered oil accumulations and volume of known oil recovery by principal and secondary lithology. —Continued

USGS Play Number	Primary Lithology	Secondary Lithology	Oil Accumulations Number	Oil Accumulations Percent of Play	Oil Volume MMBO	Oil Volume Percent of Play
Play 4932 – Glen Rose/Rodessa Updip Oil; Louisiana-Mississippi Salt Basins						
4932	anhydrite	sandstone	1	1.5	3	0.5
4932	limestone	dolomite	1	1.5	17	2.7
4932	limestone		19	29.2	89	14.5
4932	limestone	sandstone	8	12.3	57	9.2
4932	sandstone	conglomerate	1	1.5	14	2.2
4932	sandstone	limestone	10	15.4	106	17.3
4932	sandstone		25	38.5	329	53.6
PLAY TOTAL			65	100	613	100
Play 4934 – Paluxy Updip Oil; Louisiana-Mississippi Salt Basins						
4934	limestone		2	3.1	15	1.8
4934	sandstone		58	89.2	697	85.7
4934	sandstone	shale	5	7.7	102	12.5
PLAY TOTAL			65	100	814	100
Play 4937 – Tuscaloosa/Woodbine Structural Oil and Gas; Louisiana-Mississippi Salt Basins						
4937	sandstone		71	98.6	2,428	99.5
4937	sandstone	shale	1	1.4	12	0.5
PLAY TOTAL			72	100	2,441	100
Play 4945 – Wilcox Salt Basins Oil; Louisiana-Mississippi Salt Basins						
4945	sandstone		147	100	546	100
PLAY TOTAL			147	100	546	100
Play 5305 – Pennsylvanian Cyclical Carbonates and Sandstones; Cambridge Arch-Central Kansas						
5305	conglomerate		2	3.5	3	1.7
5305	limestone		49	86	144	91.8
5305	sandstone	conglomerate	1	1.8	1	0.7
5305	sandstone		5	8.8	9	5.9
PLAY TOTAL			57	100	157	100
Play 5816 – Morrow Sandstone Gas and Oil Stratigraphic; Anadarko Basin						
5816	sandstone		48	100	170	100
PLAY TOTAL			48	100	170	100
Play 6005 – Pennsylvanian Stratigraphic; Cherokee Basin						
6005	sandstone		49	100	257	100
PLAY TOTAL			49	100	257	100
Play 6301 – Anticline; Michigan Basin						
6301	dolomite	limestone	7	9.1	69	12.4
6301	dolomite		32	41.6	190	34.2
6301	limestone	dolomite	2	2.6	6	1.1
6301	limestone		36	46.8	291	52.4
PLAY TOTAL			77	100	556	100
Play 6307 – Northern Niagaran Reef; Michigan Basin						
6307	dolomite		177	100	325	100
PLAY TOTAL			177	100	325	100

Table 5. Numbers of discovered gas accumulations and volume of known gas recovery by principal and secondary lithology.

[Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Gas Accumulations Number	Gas Accumulations Percent of Play	Gas Volume BCF	Gas Volume Percent of Play
Play 903 – Western Winters through Domingene; Sacramento Basin						
903	sandstone		56	98.2	7,102	99.6
903	sandstone	shale	1	1.8	30	0.4
PLAY TOTAL			57	100	7,132	100
Play 4401 – "Pre-Pennsylvanian, Delaware - Val Verde Basins;" Permian Basin						
4401	chert	dolomite	2	1.9	709	3.1
4401	chert	limestone	6	5.6	448	1.9
4401	chert		4	3.7	435	1.9
4401	dolomite	chert	6	5.6	1,390	6
4401	dolomite	limestone	12	11.2	1,937	8.4
4401	dolomite		58	54.2	16,487	71.6
4401	limestone	chert	3	2.8	213	0.9
4401	limestone	dolomite	6	5.6	865	3.8
4401	limestone		10	9.3	553	2.4
PLAY TOTAL			107	100	23,036	100
Play 4404 – Lower Pennsylvanian (Bend) Sandstone; Permian Basin						
4404	limestone	chert	1	0.7	56	0.9
4404	limestone		19	13	611	9.5
4404	limestone	shale	1	0.7	45	0.7
4404	sandstone	dolomite	3	2.1	265	4.1
4404	sandstone	limestone	2	1.4	21	0.3
4404	sandstone		119	81.5	5,382	84.1
4404	sandstone	shale	1	0.7	22	0.3
PLAY TOTAL			146	100	6,402	100
Play 4406 – "Upper Pennsylvanian, Northwestern and Eastern Shelves, Northern Delaware and Midland Basins and Northern Central Basin Platform;" Permian Basin						
4406	conglomerate		1	2	7	0.2
4406	dolomite	limestone	1	2	34	0.8
4406	dolomite		2	4	2,313	58
4406	limestone	chert	1	2	14	0.3
4406	limestone	conglomerate	1	2	96	2.4
4406	limestone		37	74	724	18.2
4406	limestone	sandstone	1	2	17	0.4
4406	sandstone		6	12	781	19.6
PLAY TOTAL			50	100	3,986	100
Play 4407 – "Upper Pennsylvanian and Lower Permian Shelf, Slope and Basin Sandstones;" Permian Basin						
4407	chert	conglomerate	1	1.2	4	0.1
4407	conglomerate	limestone	3	3.5	606	8.1
4407	granite wash		1	1.2	8	0.1
4407	limestone	anhydrite	1	1.2	14	0.2
4407	limestone		23	27.1	1,047	14
4407	limestone	sandstone	5	5.9	95	1.3
4407	limestone	shale	1	1.2	155	2.1
4407	sandstone		49	57.6	5,542	74
4407	sandstone	shale	1	1.2	16	0.2
PLAY TOTAL			85	100	7,486	100

Table 5. Numbers of discovered gas accumulations and volume of known gas recovery by principal and secondary lithology.—Continued

USGS Play Number	Primary Lithology	Secondary Lithology	Gas Accumulations Number	Gas Accumulations Percent of Play	Gas Volume BCF	Gas Volume Percent of Play
Play 4410 – "San Andres-Clearfork, Central Basin Platform and Ozona Arch;" Permian Basin						
4410	chert	limestone	1	2	8	0.1
4410	dolomite	limestone	3	6	65	0.7
4410	dolomite		12	24	424	4.6
4410	dolomite	sandstone	1	2	10	0.1
4410	limestone	dolomite	1	2	41	0.4
4410	limestone		7	14	177	1.9
4410	limestone	sandstone	1	2	24	0.3
4410	sandstone	dolomite	5	10	8,203	88.5
4410	sandstone		19	38	316	3.4
PLAY TOTAL			50	100	9,267	100
Play 4504 – Lower Pennsylvanian (Bend) Sandstone and Conglomerate; Bend Arch-Ft. Worth Basin						
4504	conglomerate	limestone	8	6.9	111	2
4504	conglomerate		74	63.8	1,401	25.9
4504	conglomerate	sandstone	9	7.8	2,990	55.3
4504	conglomerate	shale	1	0.9	41	0.8
4504	limestone	conglomerate	2	1.7	28	0.5
4504	limestone		10	8.6	243	4.5
4504	sandstone	conglomerate	5	4.3	155	2.9
4504	sandstone		7	6	444	8.2
PLAY TOTAL			116	100	5,412	100
Play 4718 – Lower Wilcox Lobo Gas; Western Gulf						
4718	sandstone		70	100	10,355	100
PLAY TOTAL			70	100	10,355	100
Play 4719 – Lower Wilcox Fluvial Oil and Gas; Western Gulf						
4719	sandstone		48	100	2,331	100
PLAY TOTAL			48	100	2,331	100
Play 4722 – Upper Wilcox Shelf-Edge Gas and Oil; Western Gulf						
4722	sandstone		285	100	13,604	100
PLAY TOTAL			285	100	13,604	100
Play 4723 – Upper Wilcox Downdip Overpressured Gas; Western Gulf						
4723	sandstone		87	98.9	5,108	100
4723	sandstone	shale	1	1.1	7	0.1
PLAY TOTAL			88	100	5,115	100
Play 4726 – Yegua Updip Fluvial - Deltaic Oil and Gas; Western Gulf						
4726	sandstone		88	100	2,325	100
PLAY TOTAL			88	100	2,325	100
Play 4727 – Yegua Downdip Gas; Western Gulf						
4727	sandstone		61	100	1,495	100
PLAY TOTAL			61	100	1,495	100
Play 4731 – Vicksburg Downdip Gas; Western Gulf						
4731	sandstone		105	100	9,097	100
PLAY TOTAL			105	100	9,097	100

Table 5. Numbers of discovered gas accumulations and volume of known gas recovery by principal and secondary lithology.—Continued

USGS Play Number	Primary Lithology	Secondary Lithology	Gas Accumulations Number	Gas Accumulations Percent of Play	Gas Volume BCF	Gas Volume Percent of Play
Play 4732 – Frio South Texas Downdip Gas; Western Gulf						
4732	sandstone		42	97.7	2,270	95
4732	sandstone	shale	1	2.3	119	5
PLAY TOTAL			43	100	2,390	100
Play 4733 – Frio South Texas Mid-Dip Oil and Gas; Western Gulf						
4733	sandstone		295	98	25,223	95.9
4733	sandstone	shale	6	2	1,070	4.1
PLAY TOTAL			301	100	26,293	100
Play 4734 – Frio Updip Fluvial Gas and Oil; Western Gulf						
4734	sandstone		62	100	1,832	100
PLAY TOTAL			62	100	1,832	100
Play 4735 – Frio SE Texas/S. Louisiana Mid-Dip Gas and Oil; Western Gulf						
4735	sandstone		113	99.1	6,423	99.3
4735	sandstone	shale	1	0.9	44	0.7
PLAY TOTAL			114	100	6,467	100
Play 4736 – Frio SE Texas/S. Louisiana Downdip Gas; Western Gulf						
4736	sandstone		68	100	4,238	100
PLAY TOTAL			68	100	4,238	100
Play 4739 – Lower Miocene Fluvial Sandstone Oil and Gas; Western Gulf						
4739	sandstone		74	100	2,382	100
PLAY TOTAL			74	100	2,382	100
Play 4912 – Smackover Salt Basins Gas and Oil; Louisiana-Mississippi Salt Basins						
4912	dolomite	limestone	4	7.8	121	7.5
4912	dolomite		9	17.6	323	20
4912	limestone	dolomite	9	17.6	389	24
4912	limestone		29	56.9	787	48.6
PLAY TOTAL			51	100	1,620	100
Play 4926 – Hosston/Travis Peak Salt Basins Gas; Louisiana-Mississippi Salt Basins						
4926	sandstone		45	100	3,362	100
PLAY TOTAL			45	100	3,362	100
Play 4933 – Glen Rose/Rodessa Salt Basins Gas; Louisiana-Mississippi Salt Basins						
4933	limestone		43	54.4	2,429	57.9
4933	limestone	sandstone	11	13.9	1,038	24.7
4933	limestone	shale	1	1.3	22	0.5
4933	sandstone	limestone	3	3.8	242	5.8
4933	sandstone		21	26.6	466	11.1
PLAY TOTAL			79	100	4,195	100
Play 5816 – Morrow Sandstone Gas and Oil Stratigraphic; Anadarko Basin						
5816	chert	conglomerate	1	0.6	84	1.2
5816	sandstone		157	98.7	6,791	97.8
5816	sandstone	shale	1	0.6	68	1
PLAY TOTAL			159	100	6,943	100

Table 5. Numbers of discovered gas accumulations and volume of known gas recovery by principal and secondary lithology.—Continued

USGS Play Number	Primary Lithology	Secondary Lithology	Gas Accumulations Number	Gas Accumulations Percent of Play	Gas Volume BCF	Gas Volume Percent of Play
Play 6307 – Northern Niagaran Reef; Michigan Basin						
6307	dolomite		76	97.4	837	98.7
6307	limestone	dolomite	1	1.3	5	0.6
6307	limestone		1	1.3	6	0.7
PLAY TOTAL			78	100	848	100

Table 6. Analogue plays containing at least 50 accumulations by petroleum type, showing area (in square miles), the depths of observed accumulations (in feet), and the anticipated depths of undiscovered accumulations (in feet).

[Data from NRG Associates, 2001, Charpentier and others, 1996, areas were computed from data from http://energy.cr.usgs.gov/oilgas/noga/ .]

USGS play number, USGS play name, and province name	Area (mile^2)	Observed depth (ft.)				Undiscovered depth (ft.)		
		Min.	Max.	Median	Mean	Min.	Max.	Mediar
By plays containing at least 50 oil accumulations, showing depth of oil accumulation								
1302 – Neogene - Onshore; Ventura Basin	1,596	145	12,000	3,850	4,607	500	20,000	8,000
3101 – Madison (Mississippian); Williston Basin	70,935	2,980	10,174	8,662	7,638	3,000	12,000	6,500
3102 – Red River (Ordovician); Williston Basin	70,935	8,195	13,790	12,000	11,419	7,000	14,000	10,000
3103 – Middle and Upper Devonian (Pre-Bakken - Post-Prairie Salt); Williston Basin	70,935	7,200	11,854	10,676	10,053	7,000	12,000	10,000
3302 – Basin Margin Anticline; Powder River Basin	8,517	800	9,534	4,200	4,451	3,000	10,000	6,000
3304 – Upper Minnelusa Sandstone; Powder River Basin	10,504	5,004	15,098	7,953	8,358	5,000	15,000	8,500
3402 – Basin Margin Anticline; Big Horn Basin	6,294	750	10,434	4,193	4,633	1,000	12,000	4,000
3905 – Dakota Group (Combined J and D Sandstones); Denver Basin	46,130	3,881	8,582	5,324	5,665	3,300	8,800	6,000
4402 – “Pre-Pennsylvanian, Central Basin Platform”; Permian Basin	9,001	200	13,898	9,828	9,553	4,000	15,500	10,000
4403 – “Pre-Pennsylvanian, Northwestern and Eastern Shelves”; Permian Basin	39,912	5,333	14,347	11,012	10,262	5,800	13,600	10,000
4405 – “Horseshoe Atoll, Upper Pennsylvanian – Wolfcampian”; Permian Basin	3,498	1,800	10,612	7,414	7,404	6,000	10,600	8,000
4406 – “Upper Pennsylvanian, Northwestern and Eastern Shelves, Northern Delaware and Midland Basins and Northern Central Basin Platform”; Permian Basin	42,691	1,568	12,150	8,072	7,729	3,000	12,000	7,000
4407 – “Upper Pennsylvanian and Lower Permian Shelf, Slope and Basin Sandstones”; Permian Basin	18,979	790	8,876	5,728	5,608	2,000	9,000	5,000
4410 – “San Andres-Clearfork, Central Basin Platform and Ozona Arch”; Permian Basin	10,997	939	9,274	4,360	4,419	1,000	10,000	4,500
4411 – “San Andres-Clearfork, Northwestern and Eastern Shelves”; Permian Basin	46,631	350	12,230	4,908	5,497	300	10,000	5,500
4412 – Delaware Sandstones; Permian Basin	9,294	2,466	11,342	4,894	5,172	2,000	11,000	6,000
4502 – Mississippian Carbonate; Bend Arch-Ft. Worth Basin	50,180	3,197	8,816	8,019	6,776	3,000	9,000	5,500
4504 – Lower Pennsylvanian (Bend) Sandstone and Conglomerate; Bend Arch-Ft. Worth Basin	55,616	2,144	11,535	5,712	5,509	2,000	10,000	5,000
4505 – Strawn (Desmoinesian); Bend Arch-Ft. Worth Basin	55,616	550	9,391	4,144	4,136	1,000	7,000	4,000
4506 – Post-Desmoinesian; Bend Arch-Ft. Worth Basin	55,616	550	5,868	2,547	2,696	500	7,500	3,000
4701 – Houston Salt Dome Flank Oil and Gas; Western Gulf	19,760	200	8,943	5,280	4,903	250	10,000	5,125
4722 – Upper Wilcox Shelf-Edge Gas and Oil; Western Gulf	21,988	5,218	12,830	8,011	8,003	5,000	13,000	8,000
4726 – Yegua Updip Fluvial - Deltaic Oil and Gas; Western Gulf	33,043	1,079	11,670	5,791	5,621	1,000	9,000	6,000
4728 – Jackson Updip Gas and Oil; Western Gulf	18,437	383	5,795	2,236	2,538	500	6,000	4,000
4733 – Frio South Texas Mid-Dip Oil and Gas; Western Gulf	9.266	250	9,131	5,660	5,815	6,000	12,000	10,000
4735 – Frio SE Texas/S. Louisiana Mid-Dip Gas and Oil; Western Gulf	20,020	4,890	13,392	7,831	7,978	4,000	14,000	9,000
4912 – Smackover Salt Basins Gas and Oil; Louisiana-Mississippi Salt Basins	48,778	5,805	16,489	12,555	11,485	5,000	16,000	10,000
4932 – Glen Rose/Rodessa Updip Oil; Louisiana-Mississippi Salt Basins	33,786	2,445	12,458	7,500	7,499	3,000	14,000	9,000
4934 – Paluxy Updip Oil; Louisiana-Mississippi Salt Basins	34,141	2,250	12,490	7,703	7,162	3,000	13,000	8,000
4937 – Tuscaloosa/Woodbine Structural Oil and Gas; Louisiana-Mississippi Salt Basins	42,376	2,560	11,612	6,073	6,844	4,000	14,000	9,000
4945 – Wilcox Salt Basins Oil; Louisiana-Mississippi Salt Basins	37,017	420	8,336	5,480	5,270	1,000	9,000	5,000
5305 – Pennsylvanian Cyclical Carbonates and Sandstones; Cambridge Arch-Central Kansas	37,386	2,790	4,331	3,754	3,708	2,000	5,000	3,500
5816 – Morrow Sandstone Gas and Oil Stratigraphic; Anadarko Basin	35,345	4,000	10,822	6,230	6,558	4,200	13,000	5,800
6005 – Pennsylvanian Stratigraphic; Cherokee Basin	23,968	410	4,848	2,314	2,298	500	5,000	3,000
6301 – Anticline; Michigan Basin	55,911	1,244	5,145	3,422	3,306	1,200	10,000	4,000
6307 – Northern Niagaran Reef; Michigan Basin	3,863	3,100	7,097	5,800	5,601	3,000	7,200	5,500

Table 6. Analogue plays containing at least 50 accumulations by petroleum type, showing area (in square miles), the depths of observed accumulations (in feet), and the anticipated depths of undiscovered accumulations (in feet).—Continued

USGS play number, USGS play name, and province name	Area (mile^2)	Observed depth (ft.)				Undiscovered depth (ft.)		
		Min.	Max.	Median	Mean	Min.	Max.	Median
By plays containing at least 50 gas accumulations, showing depth of gas accumulation								
903 – Western Winters through Domingene; Sacramento Basin	4,761	1,100	9,890	4,740	5,121	2,000	16,000	7,000
4401 – "Pre-Pennsylvanian, Delaware - Val Verde Basins"; Permian Basin	19,730	6,555	23,622	15,896	15,666	8,400	24,000	16,000
4404 – Lower Pennsylvanian (Bend) Sandstone; Permian Basin	42,165	6,700	16,920	11,964	11,941	8,000	16,500	11,000
4406 – "Upper Pennsylvanian, Northwestern and Eastern Shelves, Northern Delaware and Midland Basins and Northern Central Basin Platform"; Permian Basin	42,691	4,920	15,907	9,593	9,235	5,000	16,000	11,000
4407 – "Upper Pennsylvanian and Lower Permian Shelf, Slope and Basin Sandstones"; Permian Basin	18,979	2,980	11,686	6,629	7,128	4,000	11,000	6,500
4410 – "San Andres–Clearfork, Central Basin Platform and Ozona Arch"; Permian Basin	10,997	1,139	7,108	3,400	3,569	4,000	11,000	7,000
4504 – Lower Pennsylvanian (Bend) Sandstone and Conglomerate; Bend Arch–Ft. Worth Basin	55,616	1,210	7,828	4,054	4,326	1,000	8,500	5,000
4718 – Lower Wilcox Lobo Gas; Western Gulf	3,033	4,975	12,000	7,959	7,903	5,000	14,000	9,000
4719 – Lower Wilcox Fluvial Oil and Gas; Western Gulf	36,318	3,954	13,620	9,562	9,156	4,000	12,000	8,000
4722 – Upper Wilcox Shelf–Edge Gas and Oil; Western Gulf	21,988	4,946	16,900	8,448	8,718	5,000	14,000	9,000
4723 – Upper Wilcox Downdip Overpressured Gas; Western Gulf	24,859	7,952	16,972	10,091	10,747	8,000	22,000	16,000
4726 – Yegua Updip Fluvial – Deltaic Oil and Gas; Western Gulf	33,043	1,763	11,700	6,275	6,275	1,000	10,000	7,000
4727 – Yegua Downdip Gas; Western Gulf	31,985	6,482	14,316	9,462	9,668	8,000	22,000	14,000
4731 – Vicksburg Downdip Gas; Western Gulf	34,996	4,635	16,748	9,080	9,414	7,000	22,000	14,000
4732 – Frio South Texas Downdip Gas; Western Gulf	6,872	6,026	14,454	7,594	8,103	6,000	18,000	12,000
4733 – Frio South Texas Mid–Dip Oil and Gas; Western Gulf	9,266	624	14,000	7,270	7,395	8,000	14,000	12,000
4734 – Frio Updip Fluvial Gas and Oil; Western Gulf	25,472	720	9,208	3,114	3,270	1,000	9,000	7,000
4735 – Frio SE Texas/S. Louisiana Mid–Dip Gas and Oil; Western Gulf	20,020	3,944	14,086	9,501	9,213	6,000	16,000	12,000
4736 – Frio SE Texas/S. Louisiana Downdip Gas; Western Gulf	9,334	7,000	14,664	10,685	10,755	8,000	20,000	14,000
4739 – Lower Miocene Fluvial Sandstone Oil and Gas; Western Gulf	32,865	797	12,325	2,610	2,838	1,000	12,000	8,000
4912 – Smackover Salt Basins Gas and Oil; Louisiana–Mississippi Salt Basins	48,778	6,939	17,292	12,441	12,486	8,000	18,000	12,000
4926 – Hosston/Travis Peak Salt Basins Gas; Louisiana–Mississippi Salt Basins	54,534	7,050	16,765	9,543	11,063	4,000	18,000	12,000
4933 – Glen Rose/Rodessa Salt Basins Gas; Louisiana–Mississippi Salt Basins	43,882	2,400	14,906	7,850	8,216	3,000	16,000	10,000
5816 – Morrow Sandstone Gas and Oil Stratigraphic; Anadarko Basin	35,345	4,446	17,722	9,076	8,954	4,200	13,000	8,300
6307 – Northern Niagaran Reef; Michigan Basin	3,863	3,395	7,211	6,082	5,792	3,400	7,500	6,000

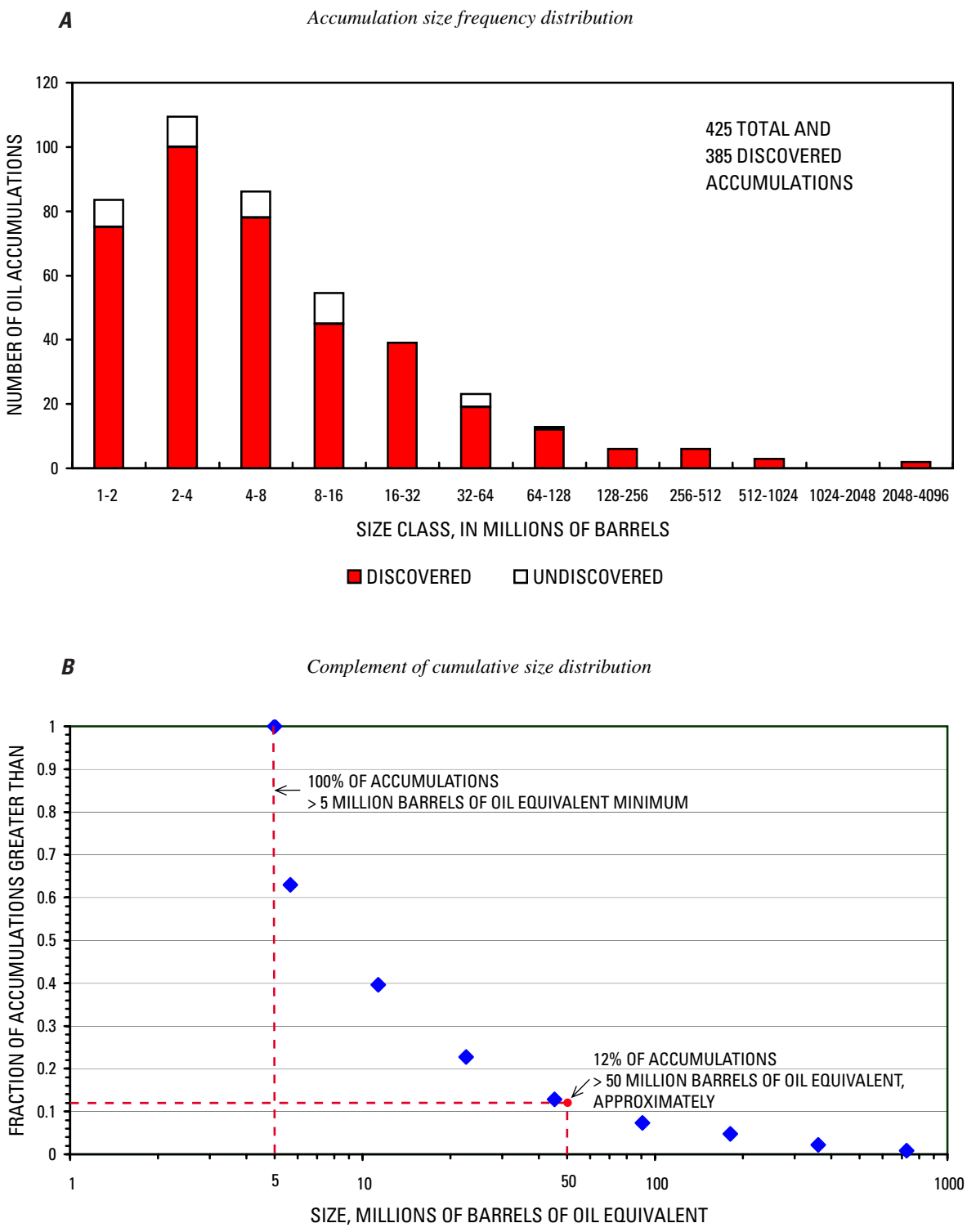

Figure 1. Play 4411–"San Andres-Clearfork, Northwestern and Eastern Shelves;" Permian Basin. *A*. Size-frequency distribution of discovered and expected undiscovered oil accumulations where the minimum accumulation size is 1 million barrels of oil equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 5 million barrels of oil equivalent.

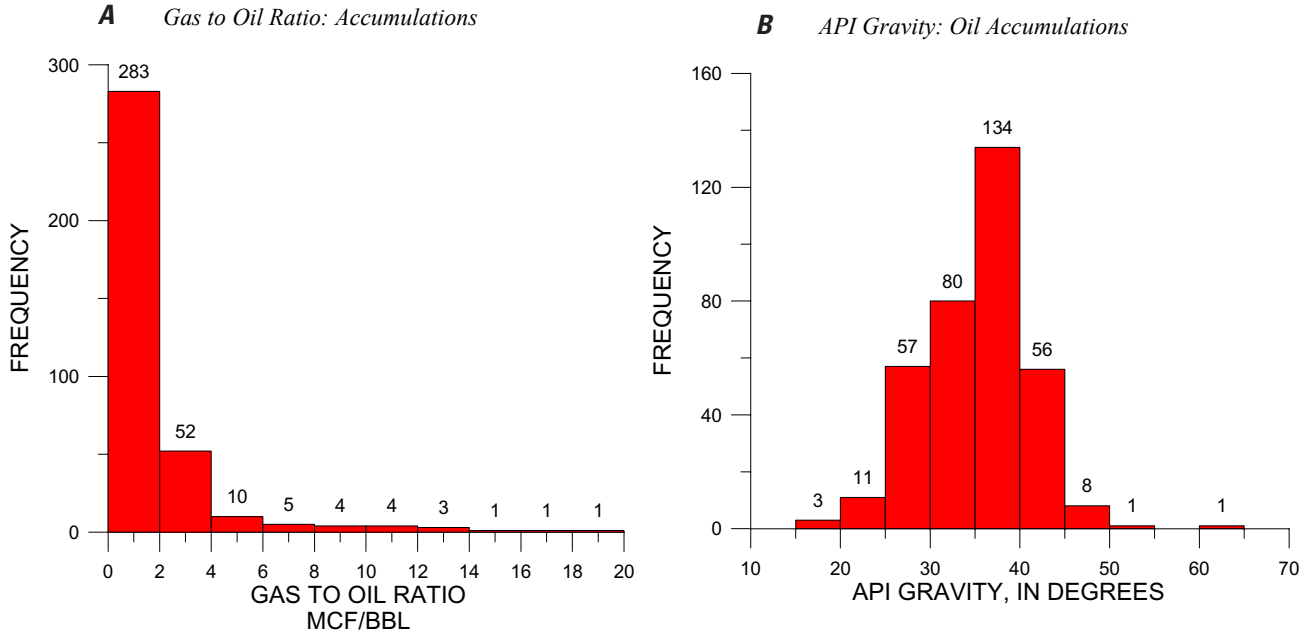

Figure 2. Play 4411–"San Andres-Clearfork, Northwestern and Eastern Shelves;" Permian Basin. *A*. Histogram of gas to oil ratios, in thousands of cubic feet per barrel, of discovered oil accumulations . *B*. Histogram of API gravities of discovered oil accumulations.

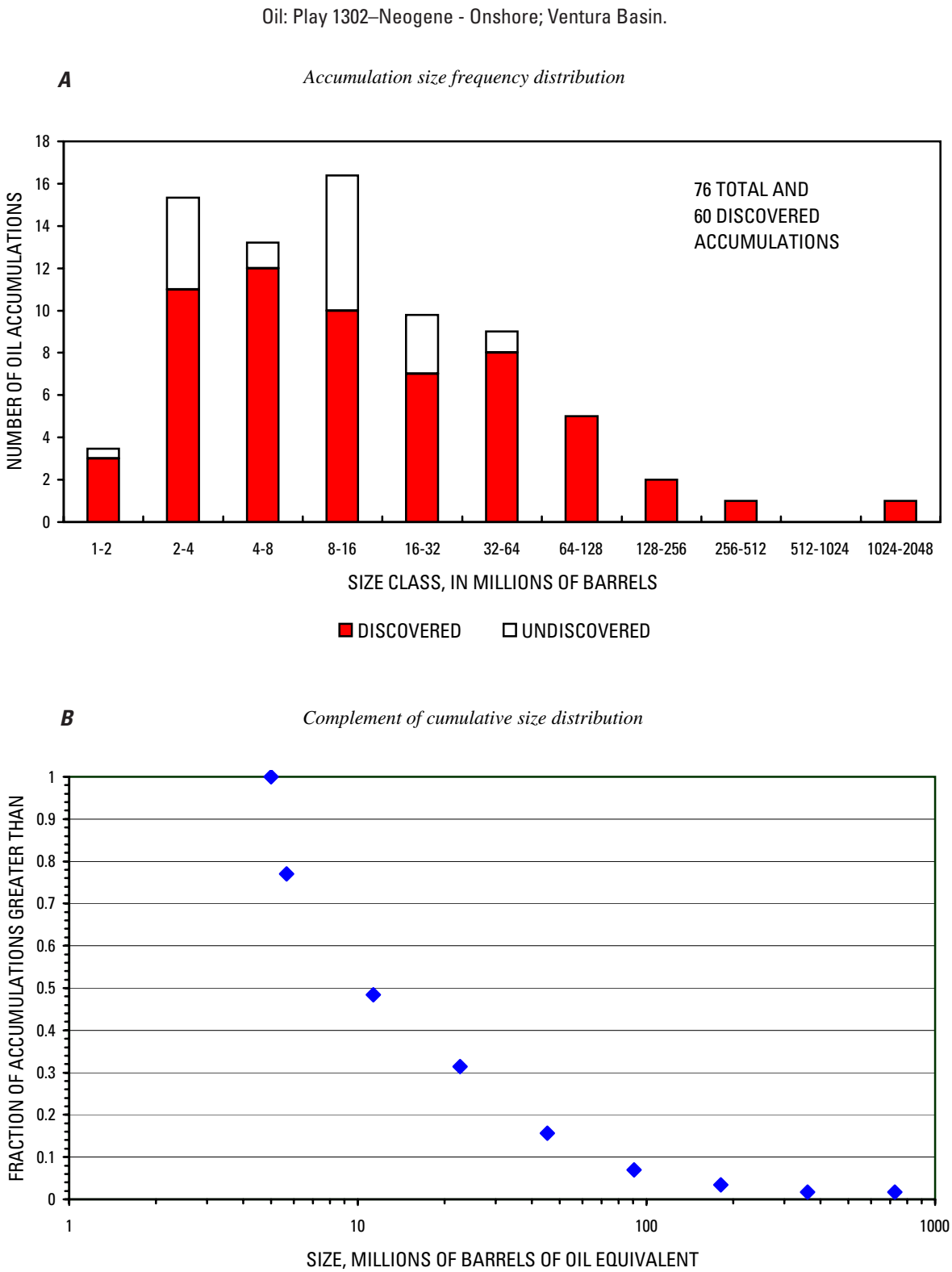

Figure 3. *A*. Size-frequency distribution of discovered and expected undiscovered oil accumulations where the minimum accumulation size is 1 million barrels of oil equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 5 million barrels of oil equivalent.

Oil: Play 1302–Neogene - Onshore; Ventura Basin.

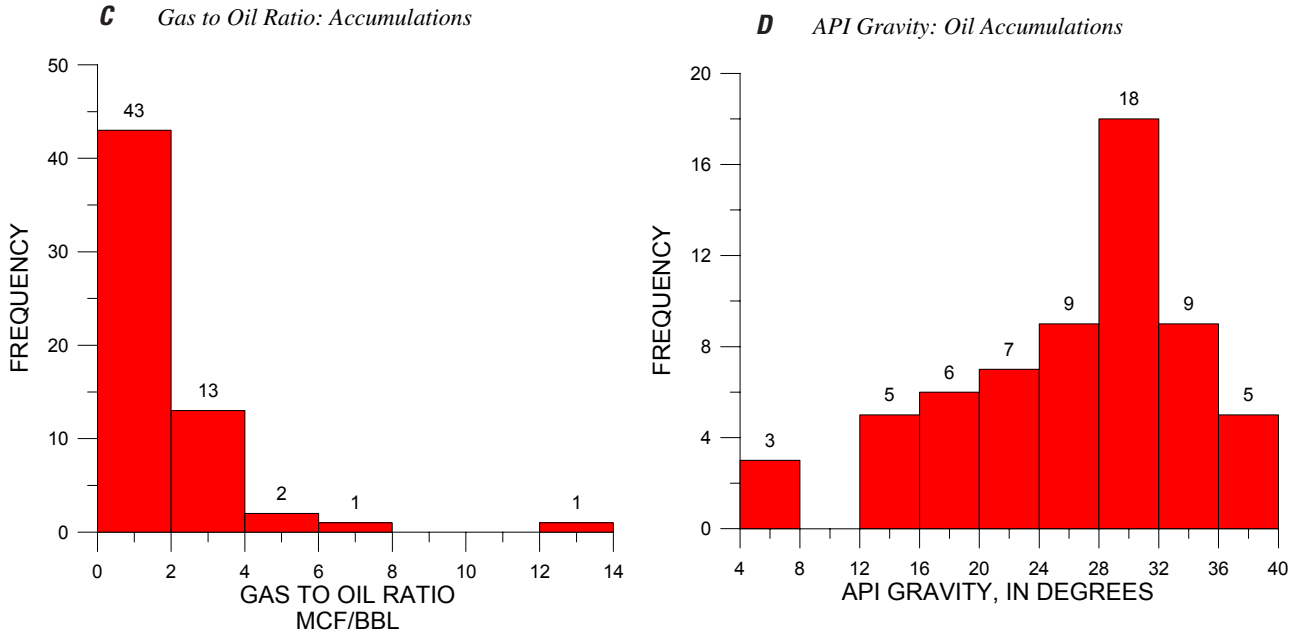

Figure 3. Continued. *C.* Histogram of gas to oil ratios, in thousands of cubic feet per barrel, of discovered oil accumulations . *D.* Histogram of API gravities of discovered oil accumulations.

Table 7. Numbers of discovered oil accumulations and volume of known oil recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Oil Accumulations Number	Oil Accumulations Percent of Play	Oil Volume MMBO	Oil Volume Percent of Play
		By lithology				
1302	sandstone		56	93.3	2,010	98.2
1302	sandstone	shale	4	6.7	38	1.8
PLAY TOTAL			60	100	2,048	100
USGS Play Number	Trap type		Number	Percent of Play	MMBO	Percent of Play
		By trap type				
1302	combination		43	71.7	1,879	91.8
1302	stratigraphic		5	8.3	12	0.6
1302	structural		12	20	156	7.6
PLAY TOTAL			60	100	2,048	100

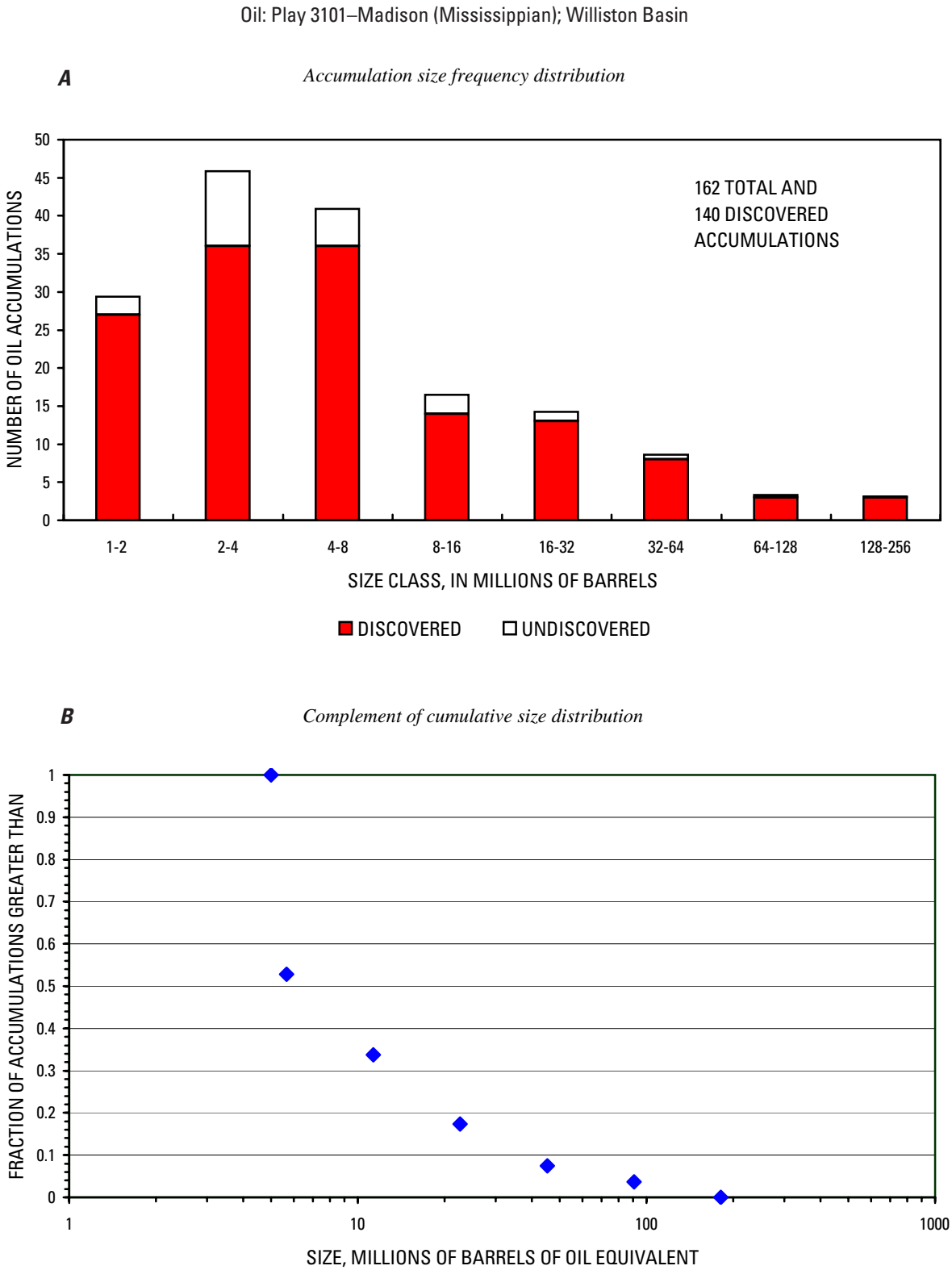

Figure 4. *A*. Size-frequency distribution of discovered and expected undiscovered oil accumulations where the minimum accumulation size is 1 million barrels of oil equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 5 million barrels of oil equivalent.

Oil: Play 3101–Madison (Mississippian); Williston Basin

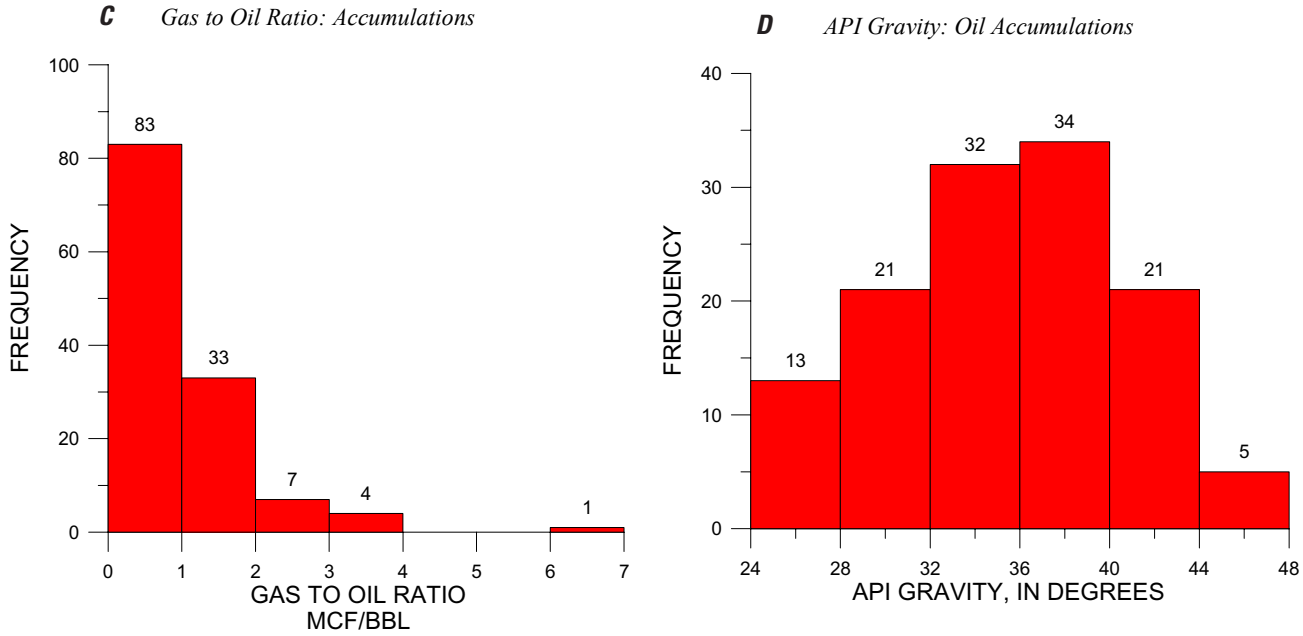

Figure 4. Continued. *C.* Histogram of gas to oil ratios, in thousands of cubic feet per barrel, of discovered oil accumulations . *D.* Histogram of API gravities of discovered oil accumulations.

Table 8. Numbers of discovered oil accumulations and volume of known oil recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Oil Accumulations Number	Oil Accumulations Percent of Play	Oil Volume MMBO	Oil Volume Percent of Play
		By lithology				
3101	carbonate		2	1.6	11	1.1
3101	dolomite	limestone	10	7.8	115	11
3101	dolomite		8	6.2	155	14.9
3101	limestone	anhydrite	1	0.8	48	4.6
3101	limestone	dolomite	16	12.5	102	9.8
3101	limestone		91	71.1	611	58.6
PLAY TOTAL			128	100	1,042	100
USGS Play Number	**Trap type**		**Number**	**Percent of Play**	**MMBO**	**Percent of Play**
		By trap type				
3101	combination		60	46.9	663	63.6
3101	stratigraphic		23	18	174	16.7
3101	structural		8	6.2	125	12
PLAY SUBTOTAL			91	71.1	962	92.3

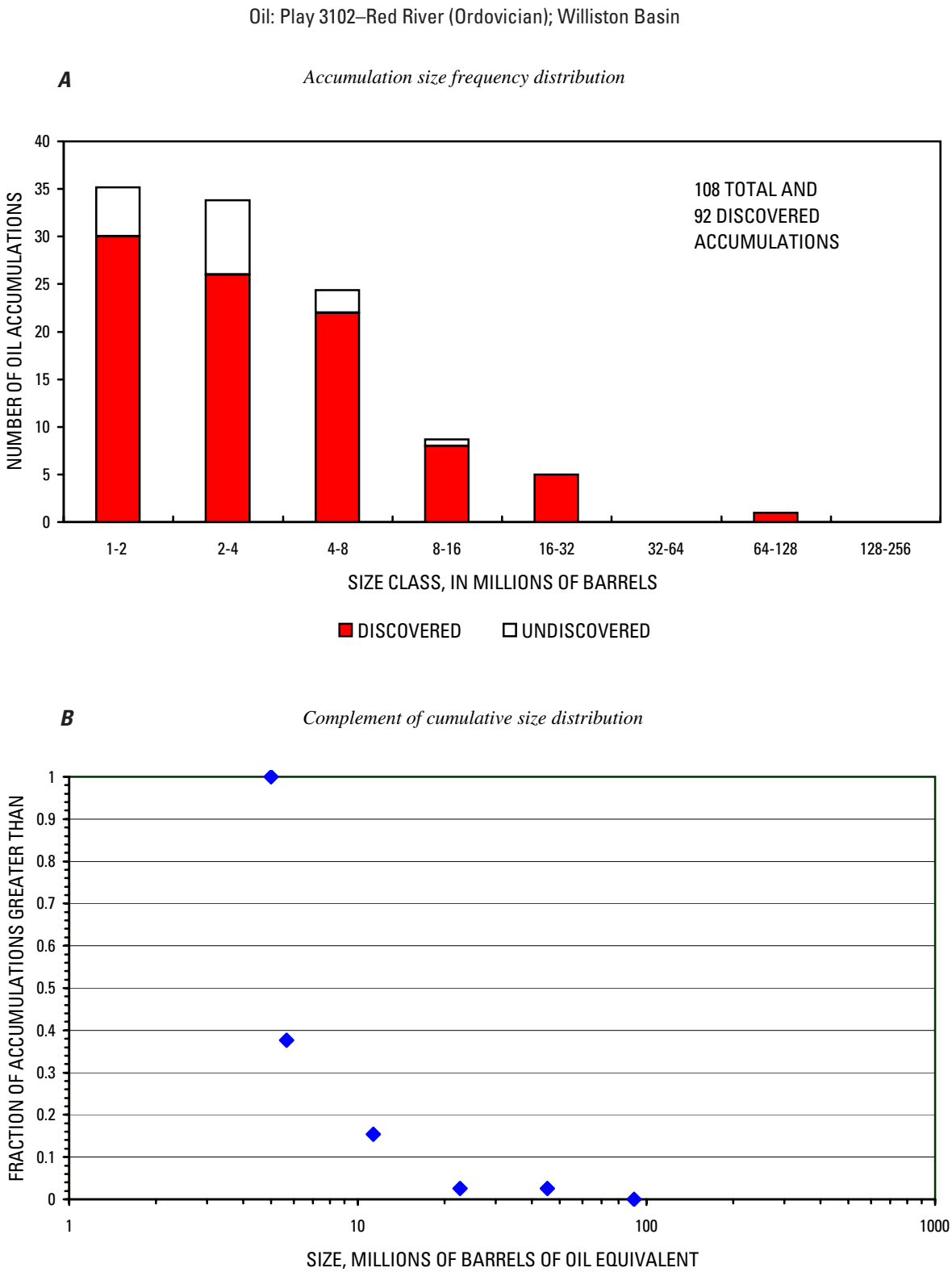

Figure 5. *A*. Size-frequency distribution of discovered and expected undiscovered oil accumulations where the minimum accumulation size is 1 million barrels of oil equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 5 million barrels of oil equivalent.

Oil: Play 3102–Red River (Ordovician); Williston Basin

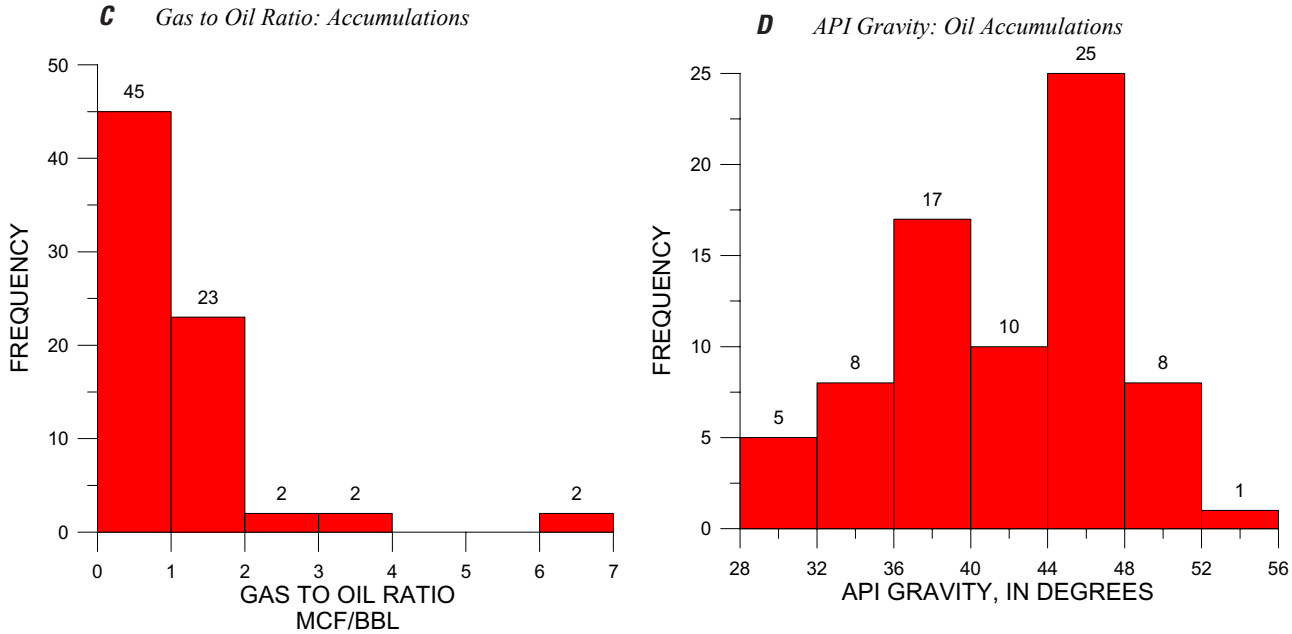

Figure 5. Continued. *C.* Histogram of gas to oil ratios, in thousands of cubic feet per barrel, of discovered oil accumulations . *D.* Histogram of API gravities of discovered oil accumulations.

Table 9. Numbers of discovered oil accumulations and volume of known oil recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Oil Accumulations Number	Oil Accumulations Percent of Play	Oil Volume MMBO	Oil Volume Percent of Play
		By lithology				
3102	dolomite	limestone	9	12.2	49	17.4
3102	dolomite		65	87.8	233	82.6
PLAY TOTAL			74	100	282	100
USGS Play Number	**Trap type**		**Number**	**Percent of Play**	**MMBO**	**Percent of Play**
		By trap type				
3102	combination		51	68.9	219	77.4
3102	structural		3	4.1	15	5.1
PLAY SUBTOTAL			54	73	233	82.5

Oil: Play 3103–Middle and Upper Devonian (Pre-Bakken - Post-Prairie Salt); Williston Basin

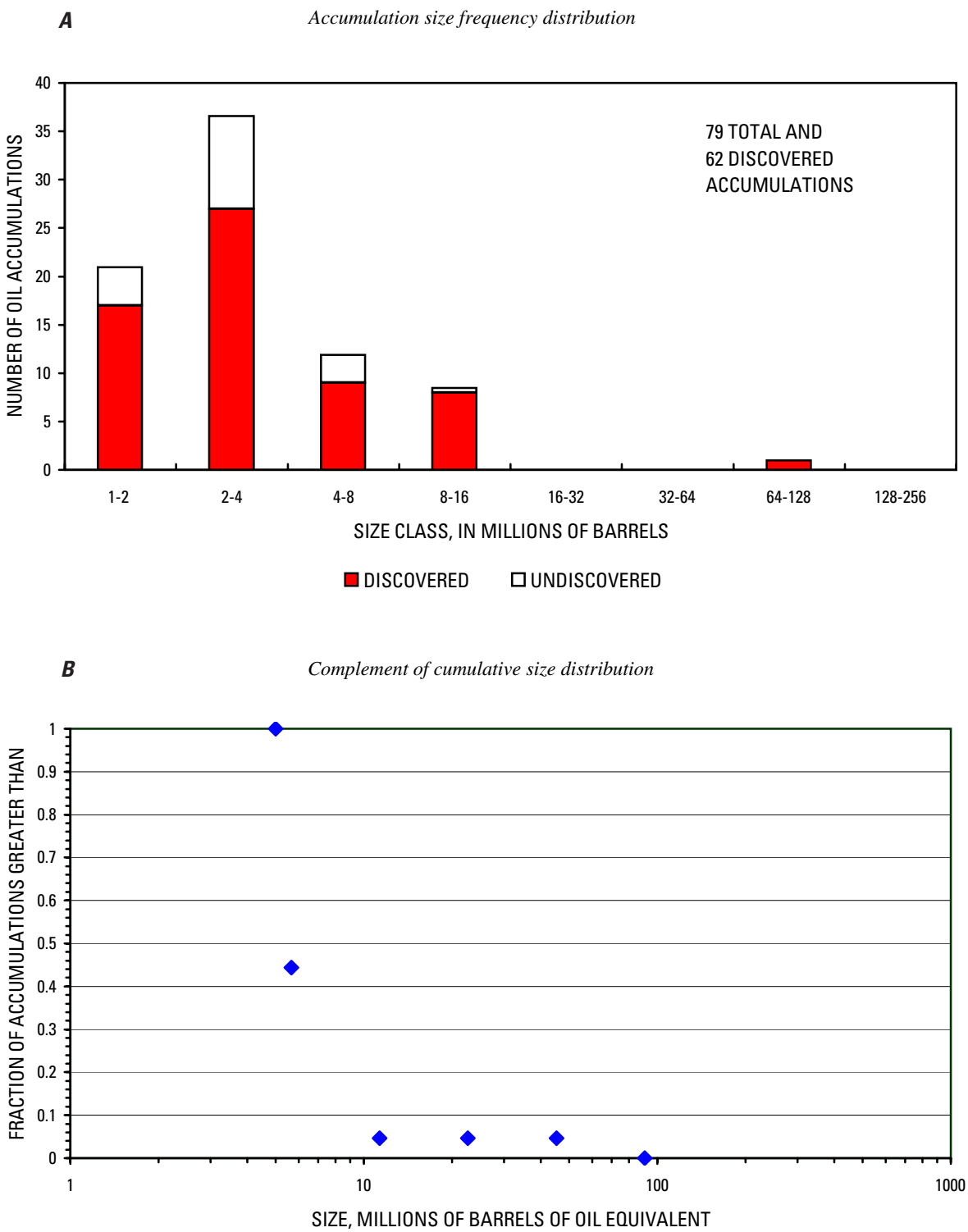

Figure 6. *A*. Size-frequency distribution of discovered and expected undiscovered oil accumulations where the minimum accumulation size is 1 million barrels of oil equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 5 million barrels of oil equivalent.

Oil: Play 3103–Middle and Upper Devonian (Pre-Bakken - Post-Prairie Salt); Williston Basin

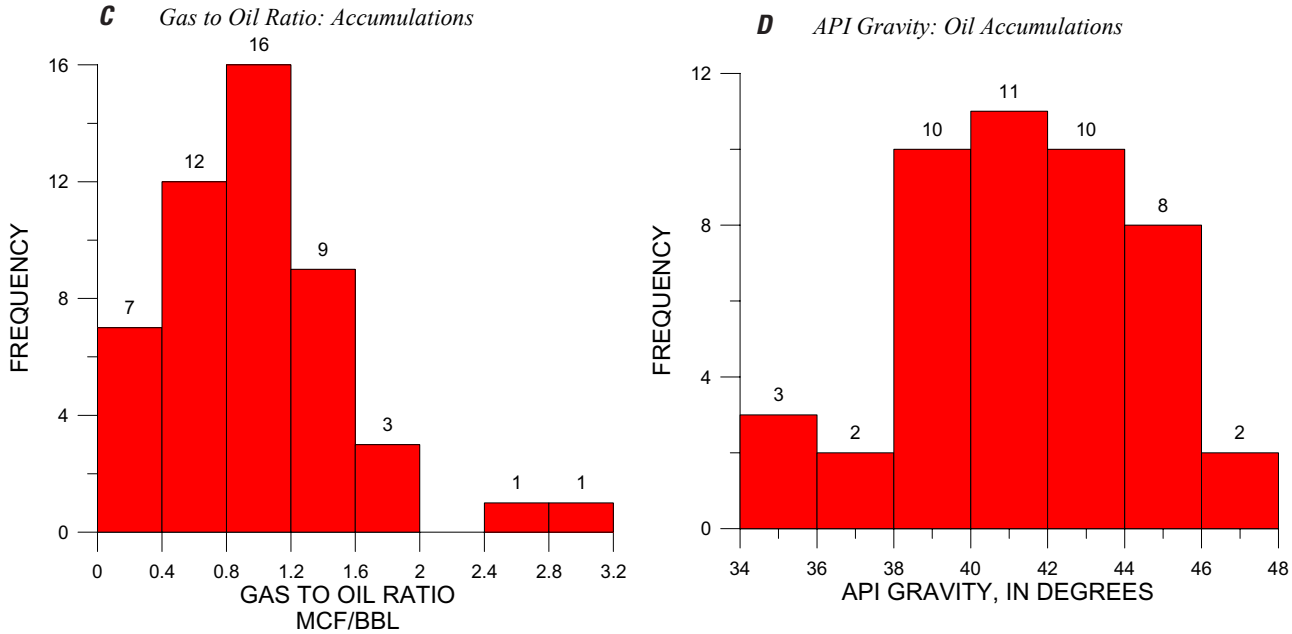

Figure 6. Continued. *C.* Histogram of gas to oil ratios, in thousands of cubic feet per barrel, of discovered oil accumulations . *D.* Histogram of API gravities of discovered oil accumulations.

Table 10. Numbers of discovered oil accumulations and volume of known oil recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Oil Accumulations Number	Oil Accumulations Percent of Play	Oil Volume MMBO	Oil Volume Percent of Play
		By lithology				
3103	dolomite	limestone	12	24.5	104	54.1
3103	dolomite		29	59.2	74	38.3
3103	limestone	dolomite	2	4.1	4	2.3
3103	limestone		6	12.2	10	5.3
PLAY TOTAL			49	100	193	100
USGS Play Number	**Trap type**		**Number**	**Percent of Play**	**MMBO**	**Percent of Play**
		By trap type				
3103	combination		26	53.1	70	36.5
3103	stratigraphic		2	4.1	6	2.9
3103	structural		3	6.1	84	43.5
PLAY SUBTOTAL			31	63.3	160	82.9

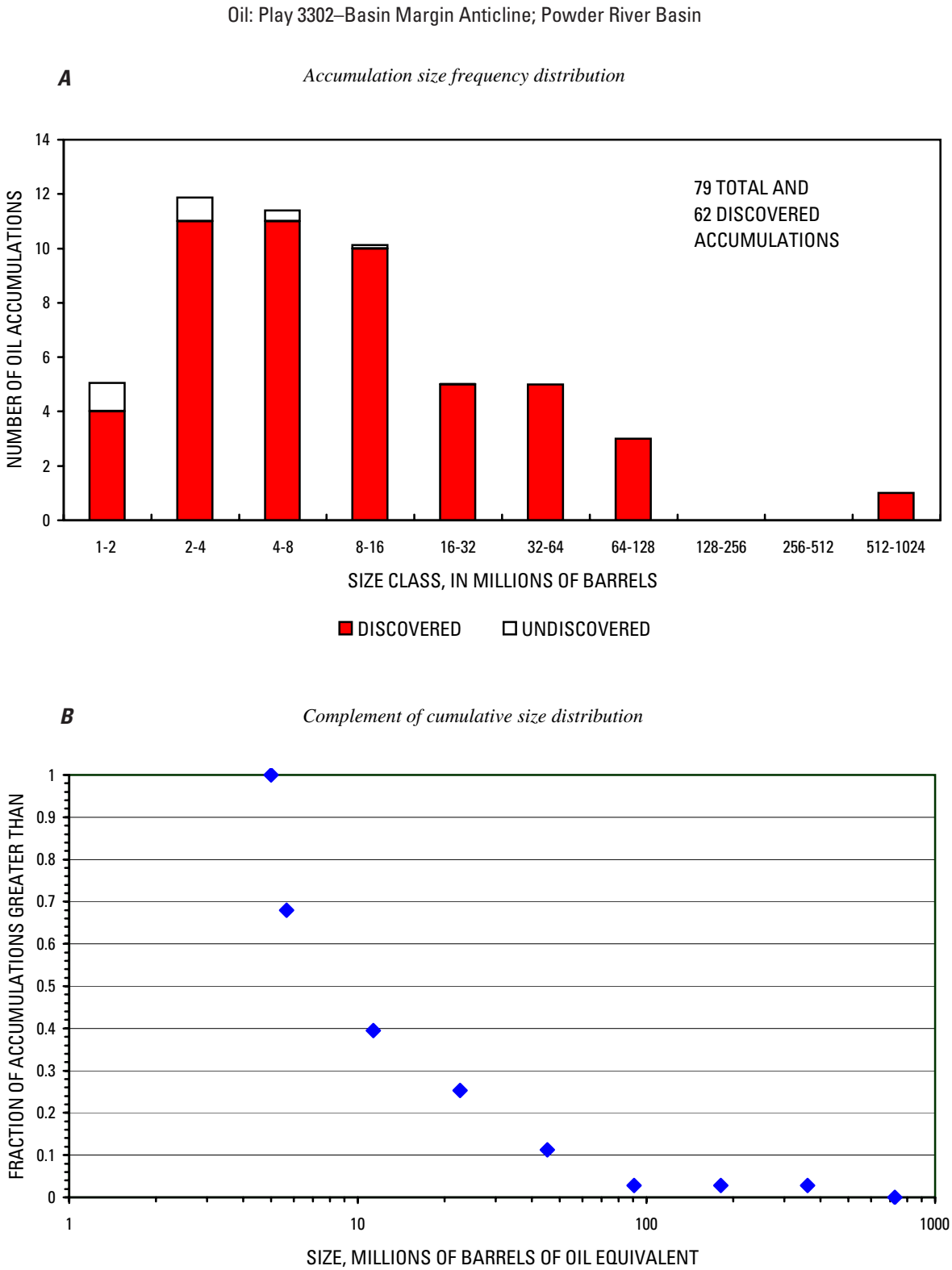

Figure 7. *A*. Size-frequency distribution of discovered and expected undiscovered oil accumulations where the minimum accumulation size is 1 million barrels of oil equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 5 million barrels of oil equivalent.

Oil: Play 3302–Basin Margin Anticline; Powder River Basin

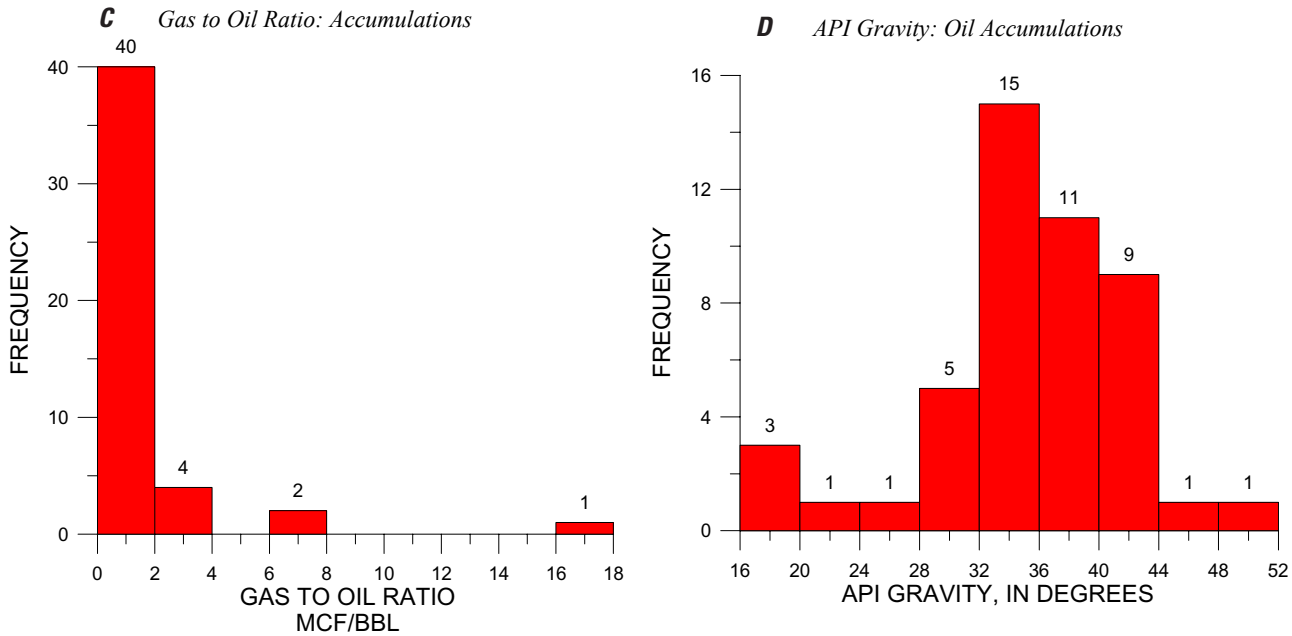

Figure 7. Continued. *C.* Histogram of gas to oil ratios, in thousands of cubic feet per barrel, of discovered oil accumulations . *D.* Histogram of API gravities of discovered oil accumulations.

Table 11. Numbers of discovered oil accumulations and volume of known oil recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Oil Accumulations Number	Oil Accumulations Percent of Play	Oil Volume MMBO	Oil Volume Percent of Play
		By lithology				
3302	dolomite		1	2.1	2	0.1
3302	limestone	dolomite	1	2.1	2	0.2
3302	sandstone	dolomite	2	4.3	70	6.1
3302	sandstone		42	89.4	1,077	93
3302	shale		1	2.1	7	0.6
PLAY TOTAL			47	100	1,158	100

USGS Play Number	Trap type	Number	Percent of Play	MMBO	Percent of Play
	By trap type				
3302	combination	31	66	984	85
3302	stratigraphic	3	6.4	6	0.5
3302	structural	13	27.7	168	14.5
PLAY TOTAL		47	100	1,158	100

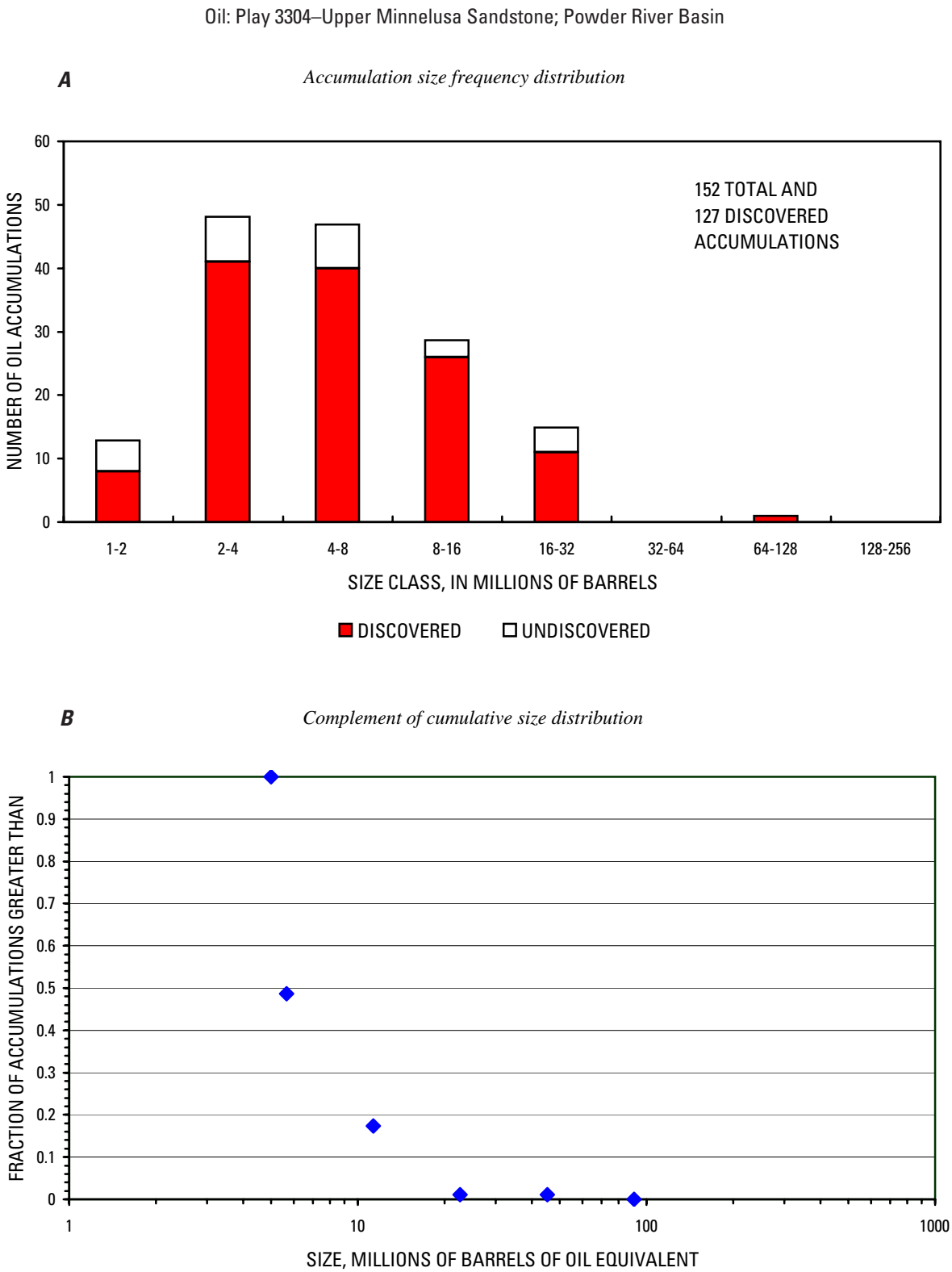

Figure 8. *A*. Size-frequency distribution of discovered and expected undiscovered oil accumulations where the minimum accumulation size is 1 million barrels of oil equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 5 million barrels of oil equivalent.

Oil: Play 3304–Upper Minnelusa Sandstone; Powder River Basin

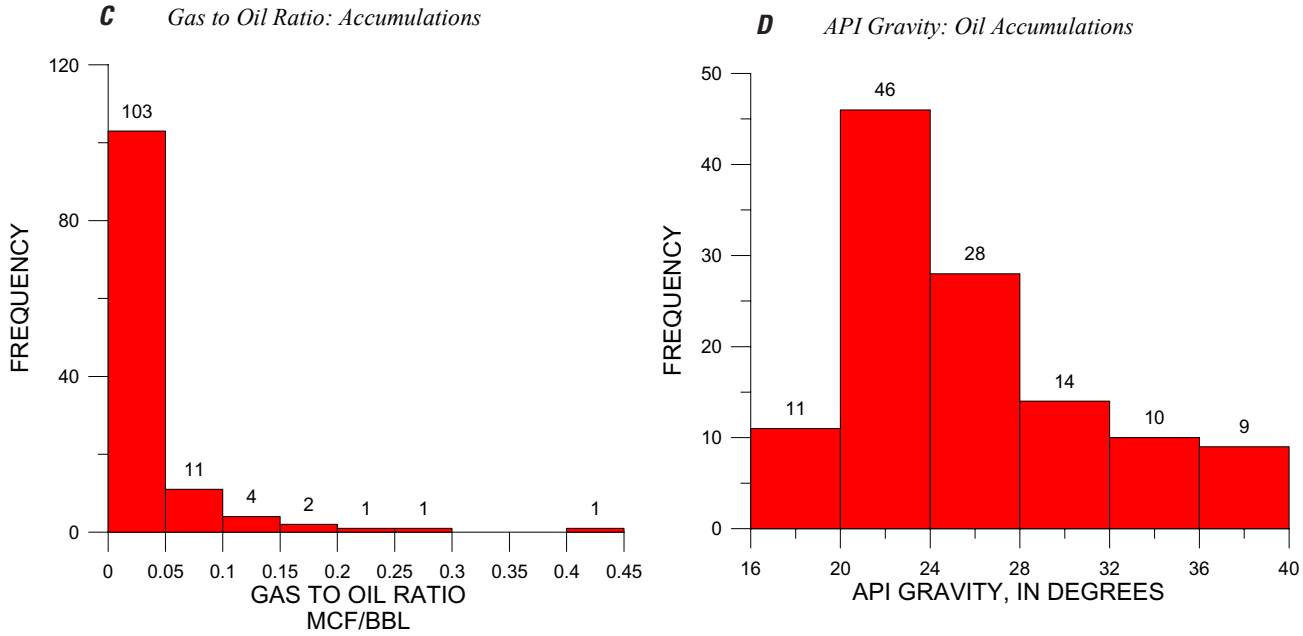

Figure 8. Continued. *C.* Histogram of gas to oil ratios, in thousands of cubic feet per barrel, of discovered oil accumulations . *D.* Histogram of API gravities of discovered oil accumulations.

Table 12. Numbers of discovered oil accumulations and volume of known oil recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Oil Accumulations Number	Oil Accumulations Percent of Play	Oil Volume MMBO	Oil Volume Percent of Play
		By lithology				
3304	sandstone	dolomite	5	4.1	41	7.3
3304	sandstone		118	95.9	521	92.7
PLAY TOTAL			123	100	562	100
USGS Play Number	Trap type		Number	Percent of Play	MMBO	Percent of Play
		By trap type				
3304	combination		28	22.8	135	24.1
3304	stratigraphic		92	74.8	422	75.1
PLAY SUBTOTAL			120	97.6	557	99.2

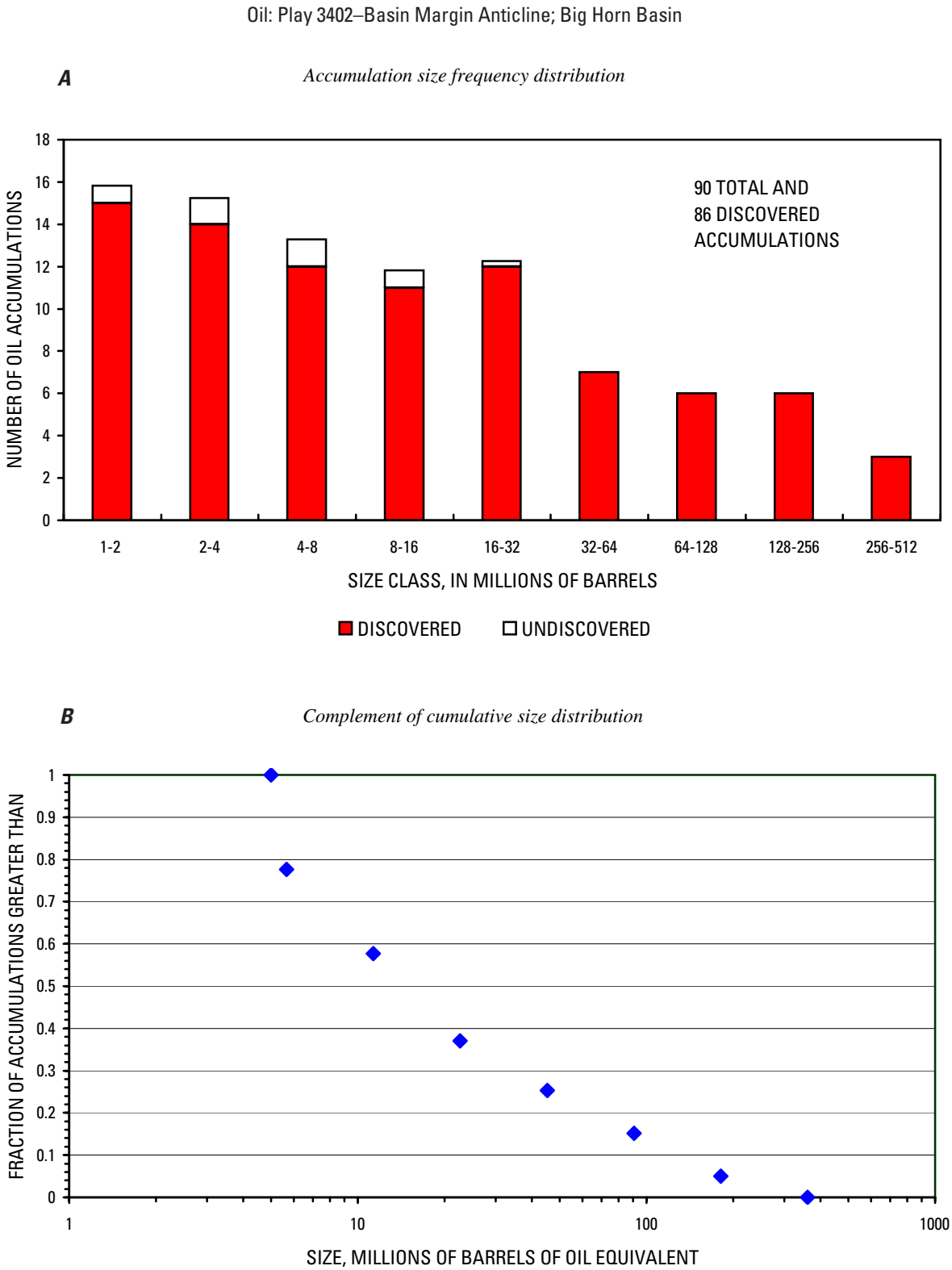

Figure 9. *A*. Size-frequency distribution of discovered and expected undiscovered oil accumulations where the minimum accumulation size is 1 million barrels of oil equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 5 million barrels of oil equivalent.

Oil: Play 3402–Basin Margin Anticline; Big Horn Basin

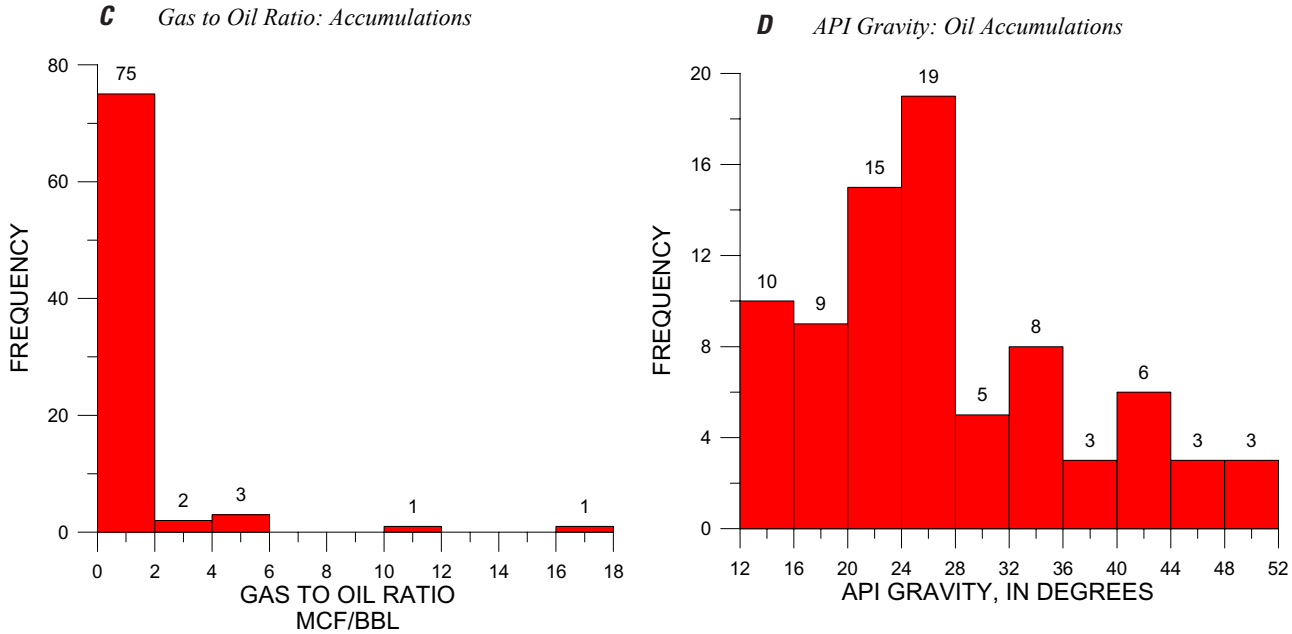

Figure 9. Continued. *C.* Histogram of gas to oil ratios, in thousands of cubic feet per barrel, of discovered oil accumulations . *D.* Histogram of API gravities of discovered oil accumulations.

Table 13. Numbers of discovered oil accumulations and volume of known oil recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Oil Accumulations Number	Oil Accumulations Percent of Play	Oil Volume MMBO	Oil Volume Percent of Play
		By lithology				
3402	dolomite	limestone	5	6.1	196	7.6
3402	dolomite		15	18.3	309	11.9
3402	dolomite	sandstone	4	4.9	16	0.6
3402	limestone	dolomite	2	2.4	14	0.5
3402	limestone		10	12.2	228	8.8
3402	limestone	sandstone	4	4.9	486	18.7
3402	sandstone	dolomite	2	2.4	371	14.3
3402	sandstone		40	48.8	971	37.5
PLAY TOTAL			82	100	2,591	100

USGS Play Number	Trap type	Number	Percent of Play	MMBO	Percent of Play
	By trap type				
3402	combination	12	14.6	61	2.3
3402	structural	69	84.1	2,529	97.6
PLAY SUBTOTAL		81	98.7	2,590	99.9

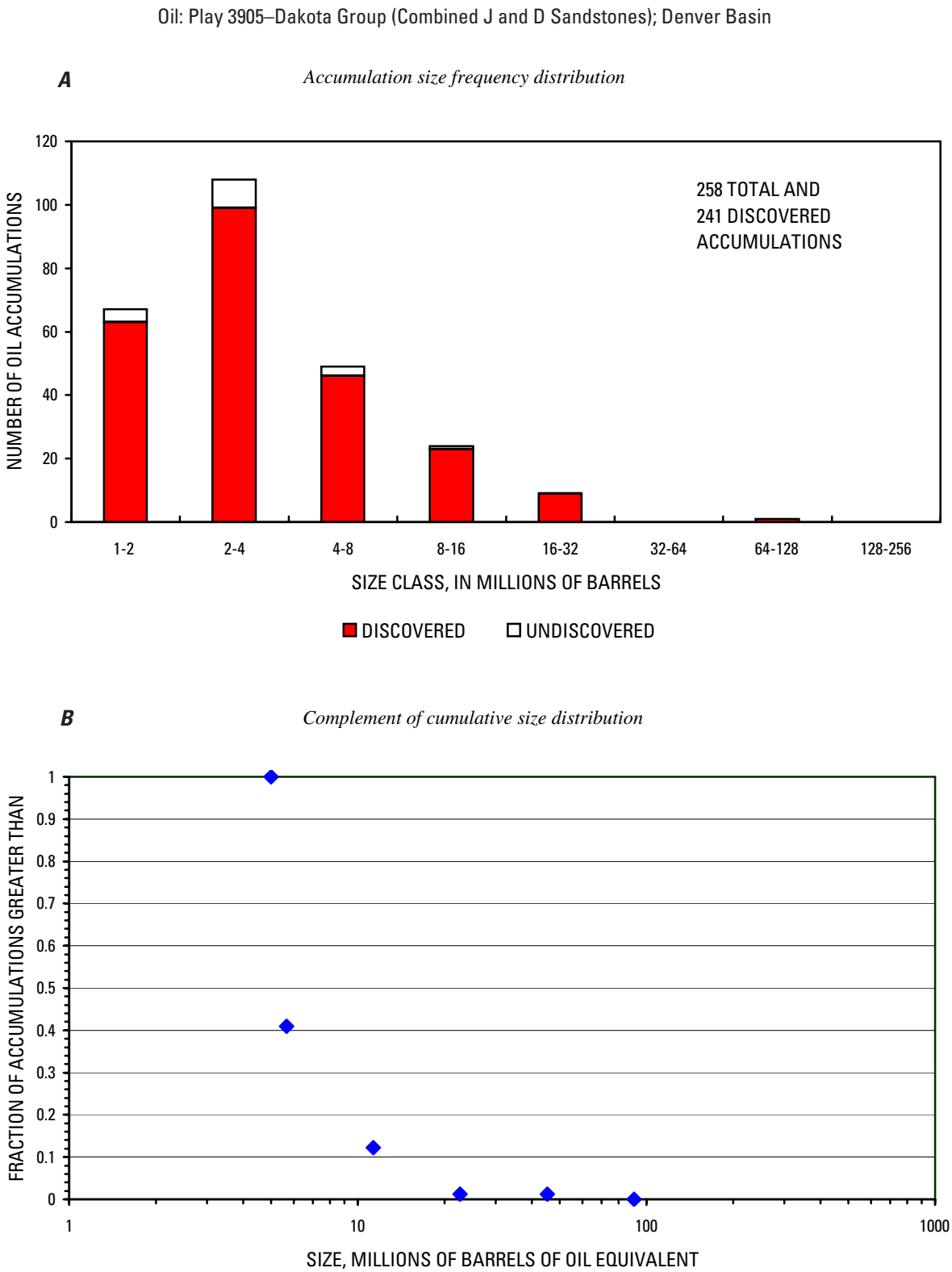

Figure 10. *A*. Size-frequency distribution of discovered and expected undiscovered oil accumulations where the minimum accumulation size is 1 million barrels of oil equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 5 million barrels of oil equivalent.

Oil: Play 3905–Dakota Group (Combined J and D Sandstones); Denver Basin

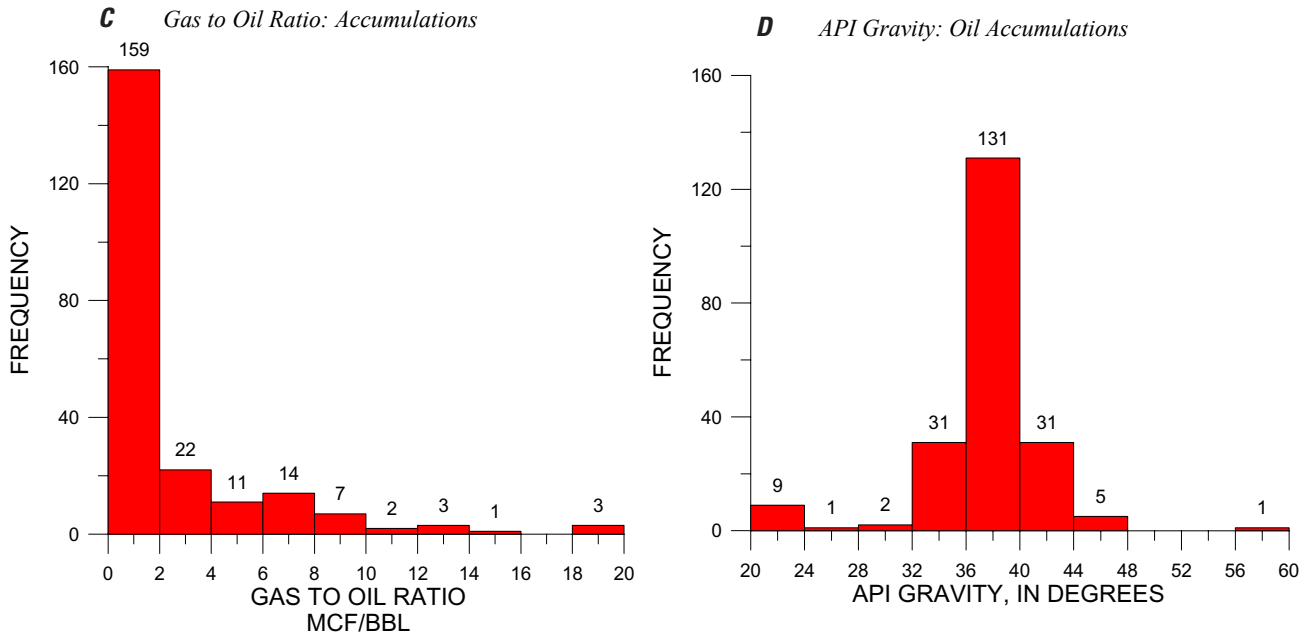

Figure 10. Continued. *C*. Histogram of gas to oil ratios, in thousands of cubic feet per barrel, of discovered oil accumulations . *D*. Histogram of API gravities of discovered oil accumulations.

Table 14. Numbers of discovered oil accumulations and volume of known oil recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Oil Accumulations Number	Oil Accumulations Percent of Play	Oil Volume MMBO	Oil Volume Percent of Play
By lithology						
3905	sandstone		220	100	630	97.9
3905	sandstone	shale	2	0.9	13	2.1
PLAY TOTAL			222	100	643	100
USGS Play Number	Trap type		Number	Percent of Play	MMBO	Percent of Play
By trap type						
3905	combination		107	48.2	372	57.8
3905	stratigraphic		75	33.8	198	30.7
3905	structural		12	5.4	34	5.3
PLAY SUBTOTAL			194	87.4	604	93.8

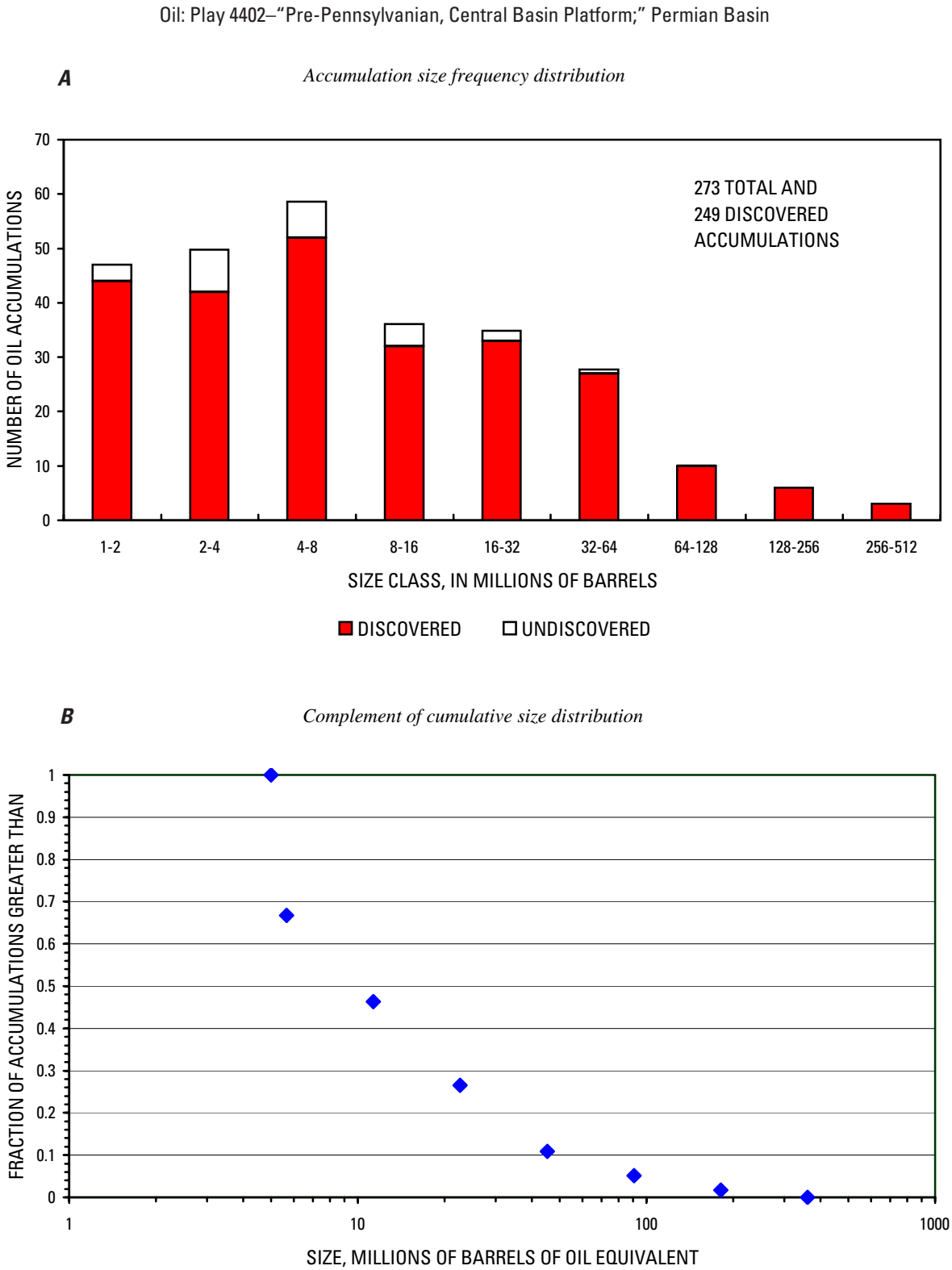

Figure 11. *A*. Size-frequency distribution of discovered and expected undiscovered oil accumulations where the minimum accumulation size is 1 million barrels of oil equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 5 million barrels of oil equivalent.

Oil: Play 4402–"Pre-Pennsylvanian, Central Basin Platform;" Permian Basin

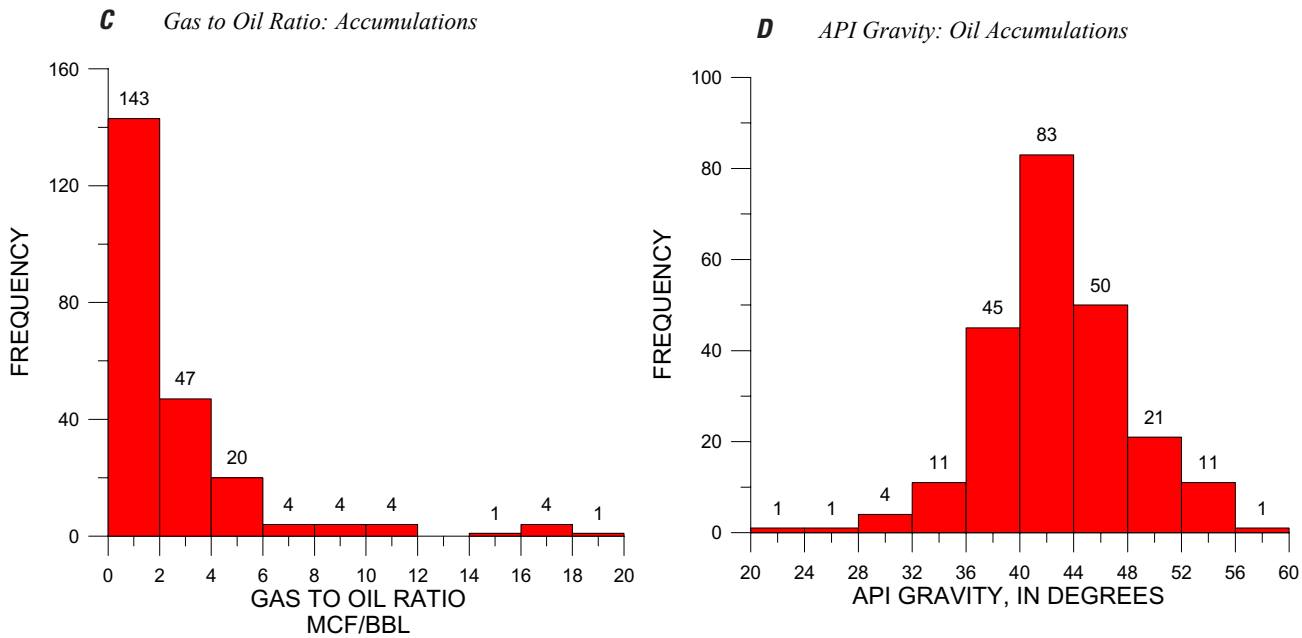

Figure 11. Continued. *C.* Histogram of gas to oil ratios, in thousands of cubic feet per barrel, of discovered oil accumulations . *D.* Histogram of API gravities of discovered oil accumulations.

Table 15. Numbers of discovered oil accumulations and volume of known oil recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Oil Accumulations Number	Oil Accumulations Percent of Play	Oil Volume MMBO	Oil Volume Percent of Play
		By lithology				
4402	carbonate		1	0.4	2	0.1
4402	chert	dolomite	3	1.3	129	4
4402	chert	limestone	7	3.1	305	9.5
4402	chert		7	3.1	17	0.5
4402	conglomerate	shale	1	0.4	29	0.9
4402	dolomite	chert	13	5.7	217	6.7
4402	dolomite	limestone	25	11	657	20.4
4402	dolomite		92	40.4	910	28.3
4402	dolomite	sandstone	2	0.9	186	5.8
4402	granite wash	conglomerate	1	0.4	9	0.3
4402	limestone	chalk	1	0.4	31	1
4402	limestone	chert	20	8.8	223	6.9
4402	limestone	dolomite	14	6.1	286	8.9
4402	limestone		20	8.8	48	1.5
4402	sandstone	dolomite	1	0.4	10	0.3
4402	sandstone		20	8.8	159	4.9
PLAY TOTAL			228	100	3,218	100

USGS Play Number	Trap type	Number	Percent of Play	MMBO	Percent of Play
	By trap type				
4402	combination	102	44.7	1,414	43.9
4402	stratigraphic	7	3.1	51	1.6
4402	structural	112	49.1	1,739	54
PLAY SUBTOTAL		221	96.9	3,203	99.5

Oil: Play 4403–"Pre-Pennsylvanian, Northwestern and Eastern Shelves;" Permian Basin

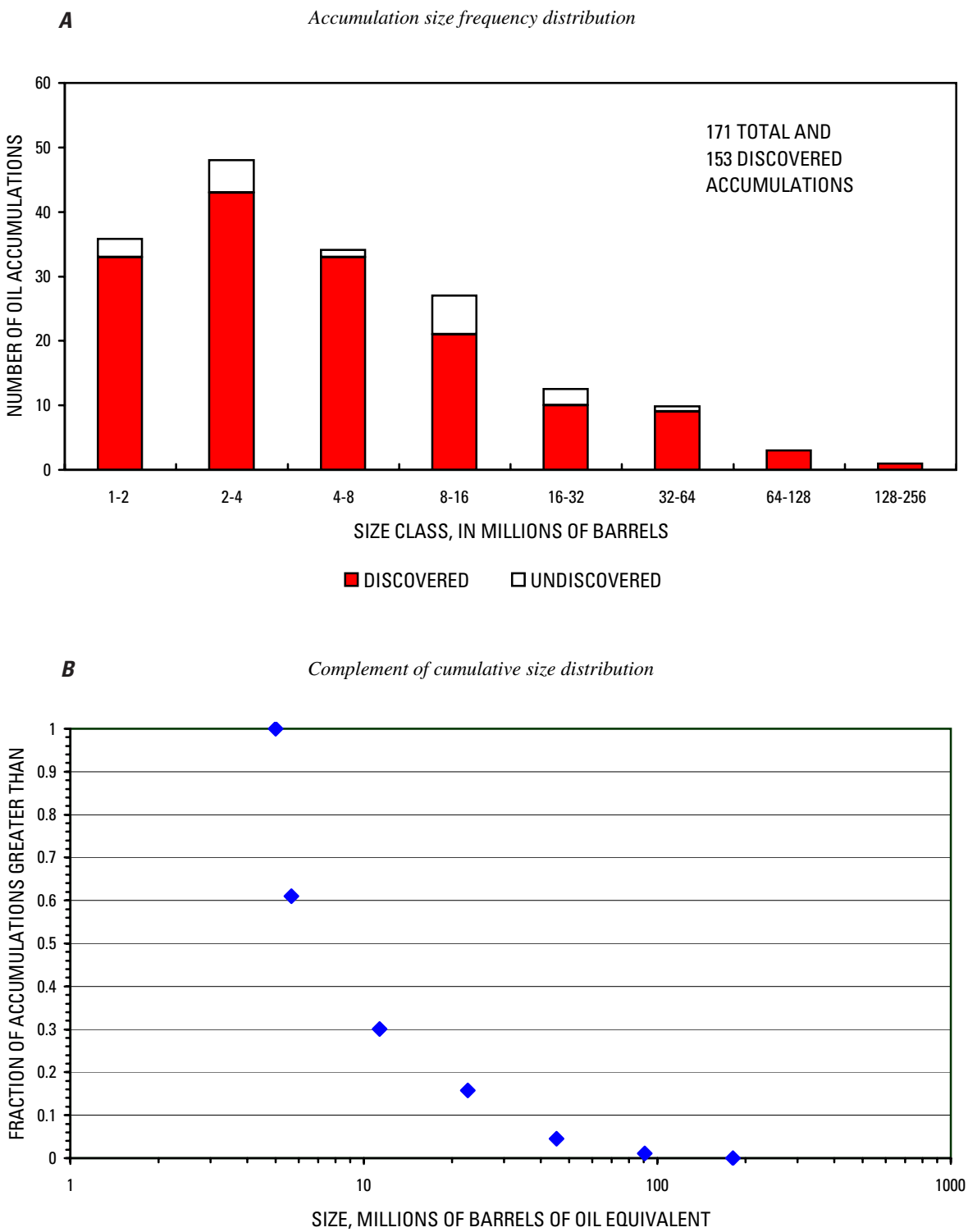

Figure 12. *A*. Size-frequency distribution of discovered and expected undiscovered oil accumulations where the minimum accumulation size is 1 million barrels of oil equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 5 million barrels of oil equivalent.

Oil: Play 4403–"Pre-Pennsylvanian, Northwestern and Eastern Shelves;" Permian Basin

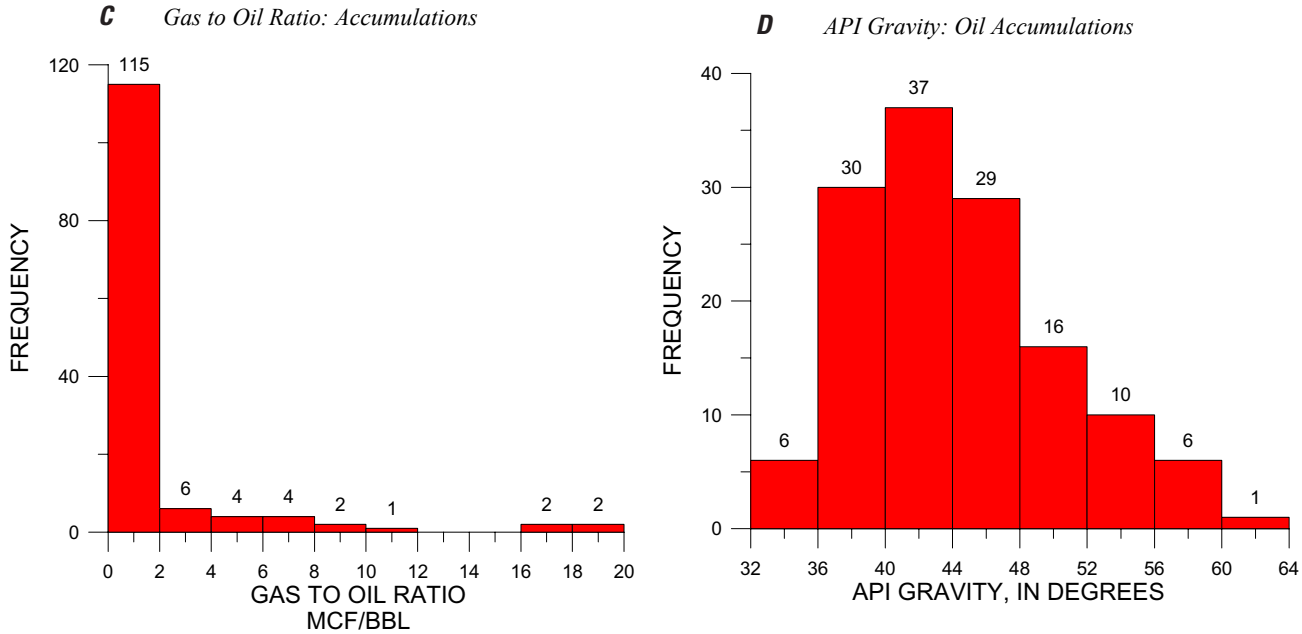

Figure 12. Continued. *C*. Histogram of gas to oil ratios, in thousands of cubic feet per barrel, of discovered oil accumulations . *D*. Histogram of API gravities of discovered oil accumulations.

Table 16. Numbers of discovered oil accumulations and volume of known oil recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Oil Accumulations Number	Oil Accumulations Percent of Play	Oil Volume MMBO	Oil Volume Percent of Play
		By lithology				
4403	carbonate		4	2.9	30	3
4403	chert	limestone	1	0.7	6	0.6
4403	chert		1	0.7	1	0
4403	dolomite	chert	2	1.5	5	0.5
4403	dolomite	limestone	15	11	224	22.5
4403	dolomite		90	66.2	653	65.6
4403	dolomite	sandstone	1	0.7	5	0.5
4403	limestone	chert	1	0.7	2	0.2
4403	limestone	dolomite	6	4.4	28	2.8
4403	limestone		12	8.8	22	2.2
4403	sandstone	dolomite	1	0.7	7	0.7
4403	sandstone		2	1.5	13	1.3
PLAY TOTAL			136	100	996	100

USGS Play Number	Trap type	Number	Percent of Play	MMBO	Percent of Play
	By trap type				
4403	combination	61	44.9	547	54.9
4403	stratigraphic	8	5.9	59	5.9
4403	structural	48	35.3	316	31.7
PLAY SUBTOTAL		117	86.1	922	92.5

Oil: Play 4405–"Horseshoe Atoll, Upper Pennsylvanian–Wolfcampian;" Permian Basin

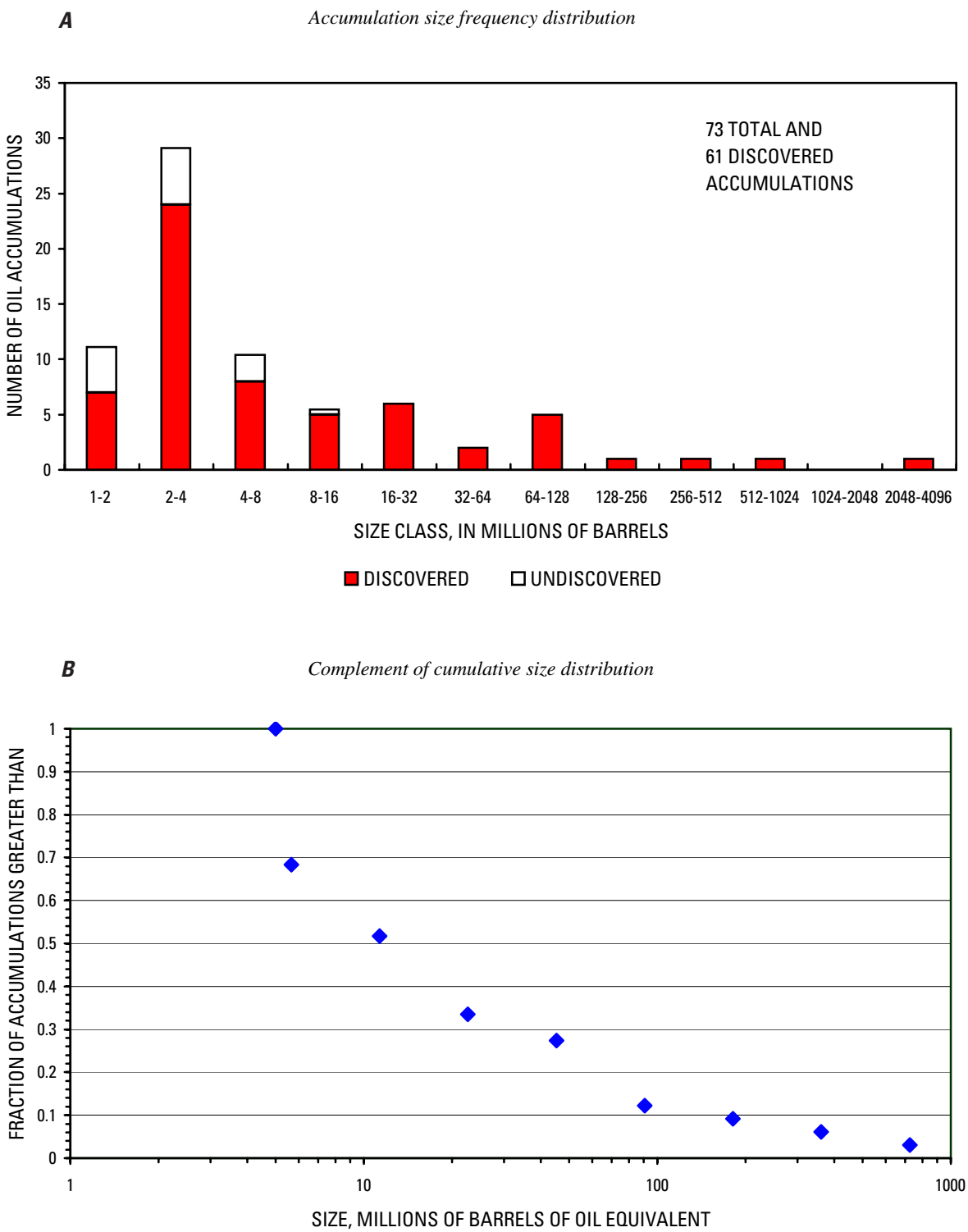

Figure 13. *A*. Size-frequency distribution of discovered and expected undiscovered oil accumulations where the minimum accumulation size is 1 million barrels of oil equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 5 million barrels of oil equivalent.

Oil: Play 4405–"Horseshoe Atoll, Upper Pennsylvanian–Wolfcampian;" Permian Basin

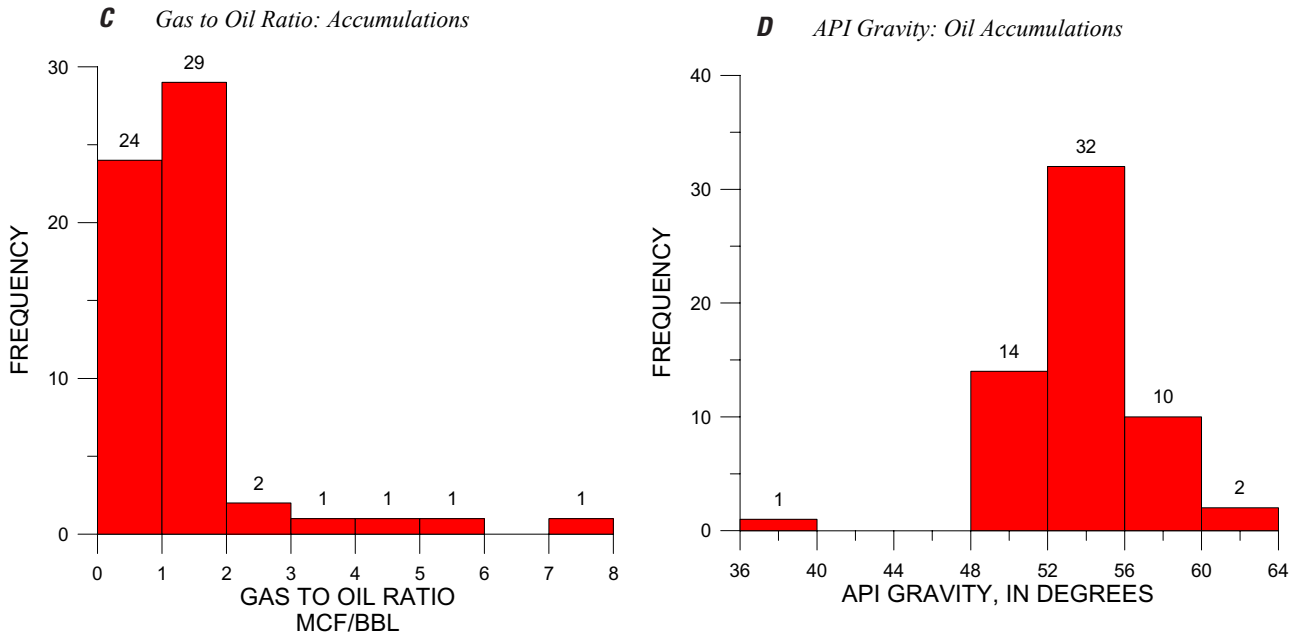

Figure 13. Continued. *C*. Histogram of gas to oil ratios, in thousands of cubic feet per barrel, of discovered oil accumulations . *D*. Histogram of API gravities of discovered oil accumulations.

Table 17. Numbers of discovered oil accumulations and volume of known oil recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Oil Accumulations Number	Oil Accumulations Percent of Play	Oil Volume MMBO	Oil Volume Percent of Play
		By lithology				
4405	limestone	dolomite	3	5.1	130	4.6
4405	limestone		49	83.1	2,393	84.4
4405	limestone	sandstone	1	1.7	269	9.5
4405	sandstone	limestone	4	6.8	27	1
4405	sandstone		2	3.4	17	0.6
PLAY TOTAL			59	100	2,835	100

USGS Play Number	Trap type	Number	Percent of Play	MMBO	Percent of Play
	By trap type				
4405	combination	1	1.7	2	0.1
4405	stratigraphic	58	98.3	2,833	99.9
PLAY TOTAL		59	100	2,835	100

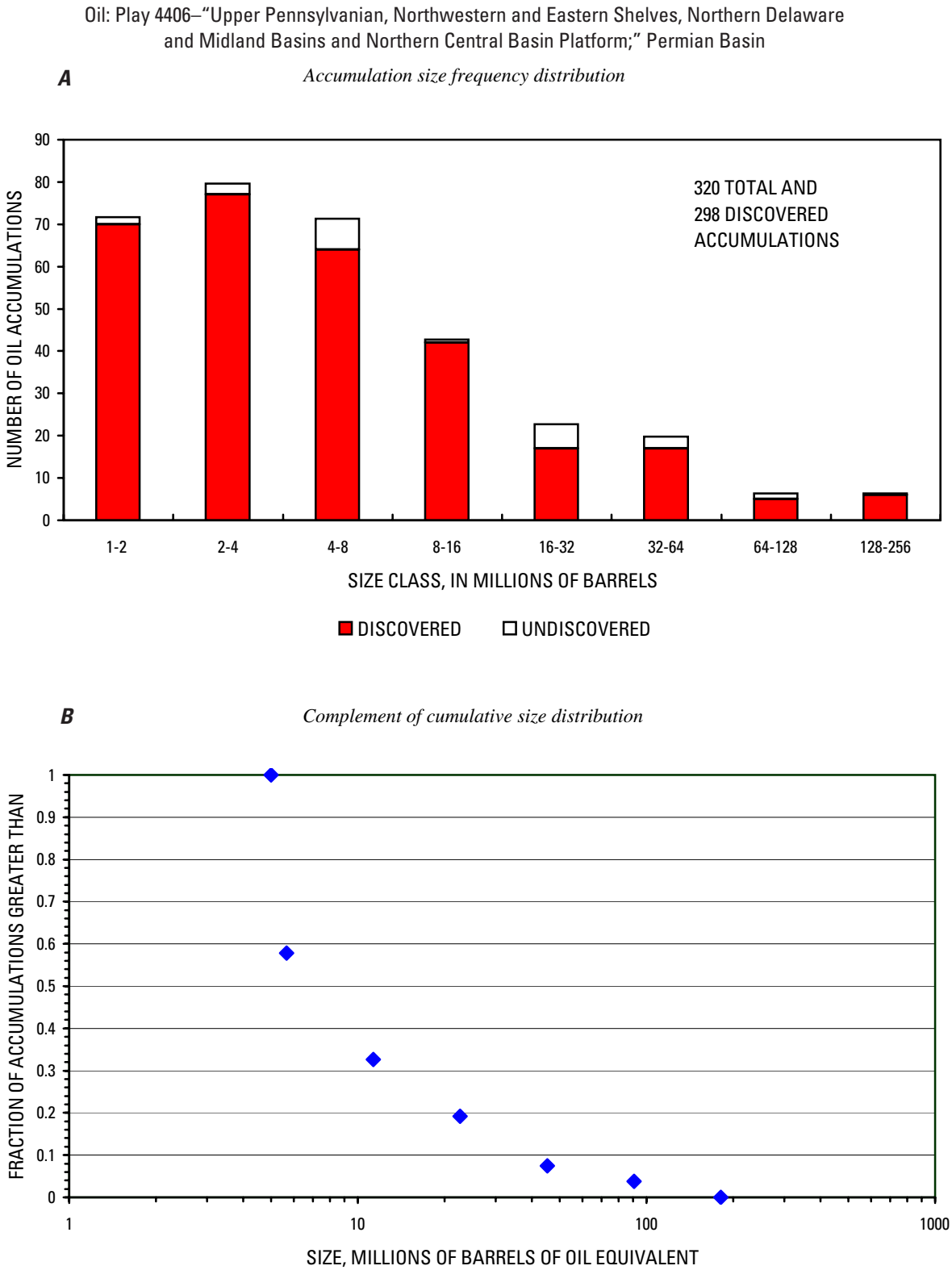

Figure 14. *A*. Size-frequency distribution of discovered and expected undiscovered oil accumulations where the minimum accumulation size is 1 million barrels of oil equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 5 million barrels of oil equivalent.

Oil: Play 4406–"Upper Pennsylvanian, Northwestern and Eastern Shelves, Northern Delaware and Midland Basins and Northern Central Basin Platform;" Permian Basin

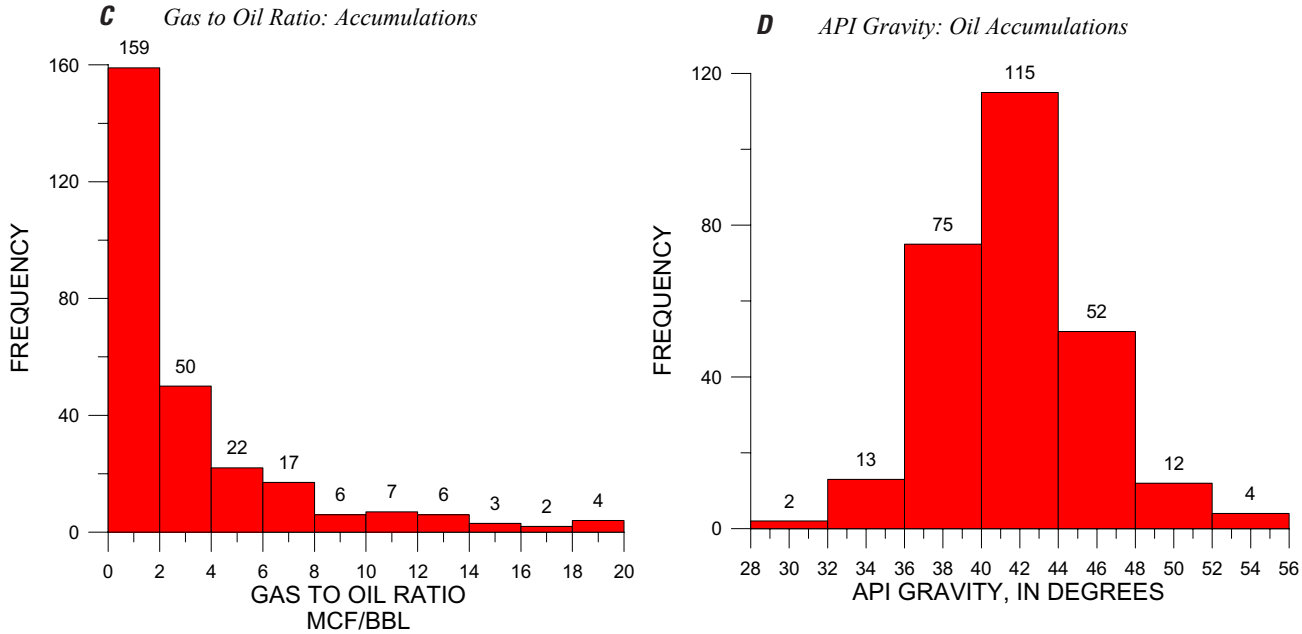

Figure 14. Continued. *C.* Histogram of gas to oil ratios, in thousands of cubic feet per barrel, of discovered oil accumulations . *D.* Histogram of API gravities of discovered oil accumulations.

Table 18. Numbers of discovered oil accumulations and volume of known oil recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Oil Accumulations: Number	Oil Accumulations: Percent of Play	Oil Volume: MMBO	Oil Volume: Percent of Play
		By lithology				
4406	chert	limestone	1	0.4	24	1.5
4406	chert		1	0.4	4	0.2
4406	conglomerate	chert	1	0.4	1	0.1
4406	conglomerate	limestone	1	0.4	0	0
4406	conglomerate		2	0.7	2	0.1
4406	dolomite	limestone	2	0.7	12	0.7
4406	dolomite		6	2.2	83	5.2
4406	limestone	chalk	2	0.7	2	0.1
4406	limestone	chert	2	0.7	8	0.5
4406	limestone	conglomerate	1	0.4	1	0.1
4406	limestone	dolomite	7	2.5	112	7
4406	limestone		174	63	1,018	63.6
4406	limestone	sandstone	19	6.9	75	4.7
4406	sandstone	conglomerate	1	0.4	2	0.1
4406	sandstone	limestone	6	2.2	25	1.6
4406	sandstone		50	18.1	233	14.6
PLAY TOTAL			276	100	1,602	100

USGS Play Number	Trap type	Number	Percent of Play	MMBO	Percent of Play
	By trap type				
4406	combination	122	44.2	888	55.5
4406	stratigraphic	91	33	589	36.8
4406	structural	29	10.5	78	4.8
PLAY SUBTOTAL		242	87.7	1,555	97.1

Oil: Play 4407–"Upper Pennsylvanian and Lower Permian Shelf, Slope and Basin Sandstones;" Permian Basin

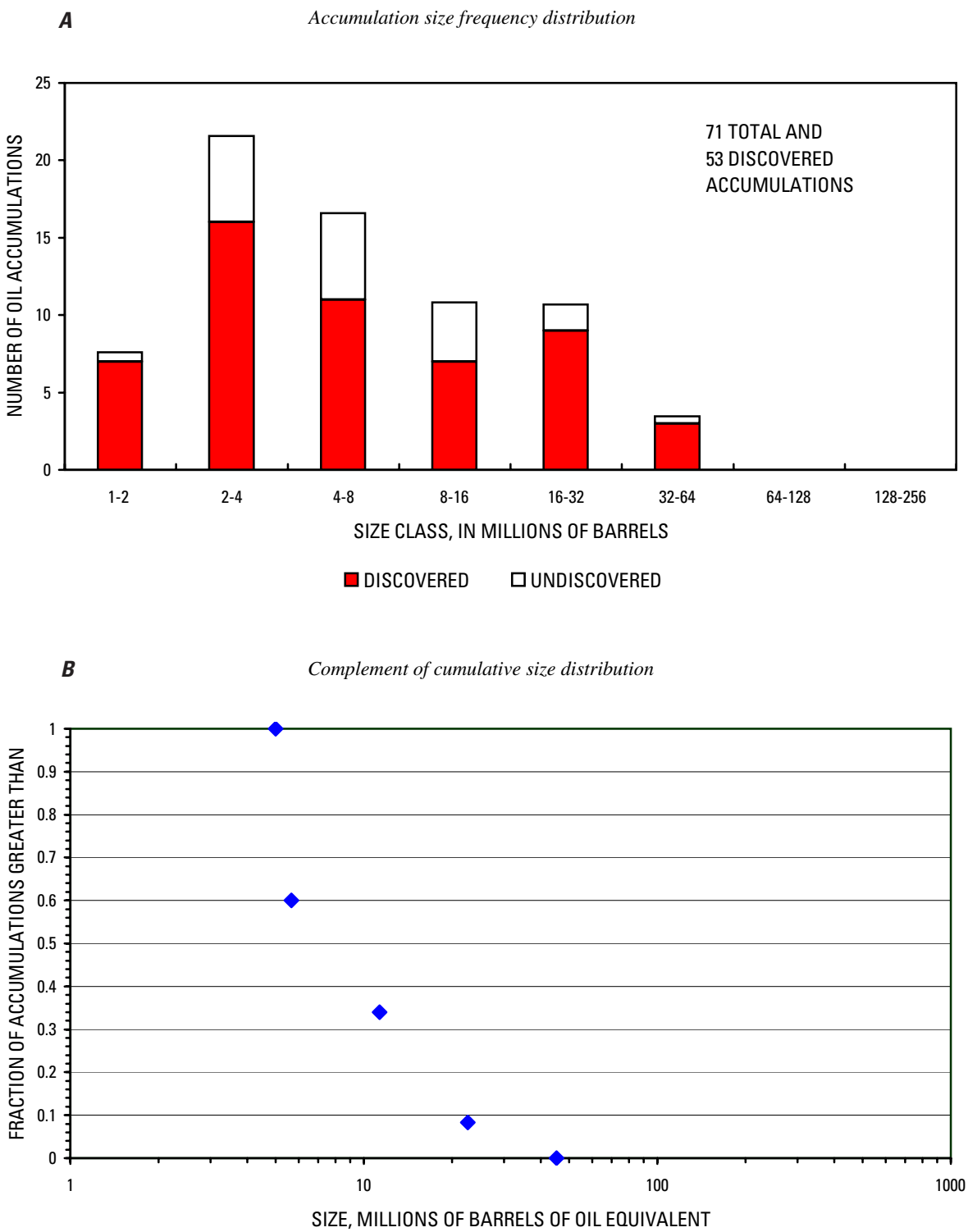

Figure 15. *A*. Size-frequency distribution of discovered and expected undiscovered oil accumulations where the minimum accumulation size is 1 million barrels of oil equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 5 million barrels of oil equivalent.

Oil: Play 4407–"Upper Pennsylvanian and Lower Permian Shelf, Slope and Basin Sandstones;" Permian Basin

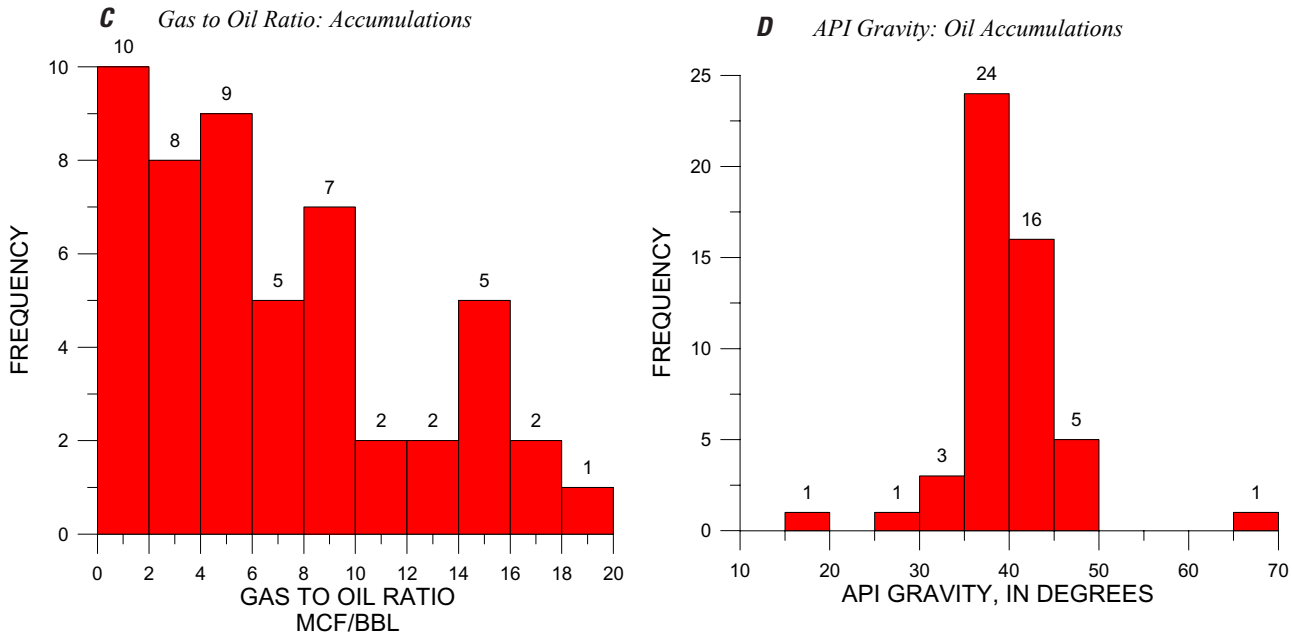

Figure 15. Continued. *C*. Histogram of gas to oil ratios, in thousands of cubic feet per barrel, of discovered oil accumulations . *D*. Histogram of API gravities of discovered oil accumulations.

Table 19. Numbers of discovered oil accumulations and volume of known oil recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Oil Accumulations Number	Oil Accumulations Percent of Play	Oil Volume MMBO	Oil Volume Percent of Play
		By lithology				
4407	conglomerate		1	2	2	0.9
4407	dolomite	sandstone	1	2	2	0.8
4407	limestone	conglomerate	1	2	9	4.4
4407	limestone	dolomite	1	2	1	0.3
4407	limestone		16	31.4	132	62.3
4407	limestone	sandstone	5	9.8	12	5.5
4407	sandstone	limestone	2	3.9	9	4.1
4407	sandstone		24	47.1	46	21.6
PLAY TOTAL			51	100	212	100

USGS Play Number	Trap type	Number	Percent of Play	MMBO	Percent of Play
	By trap type				
4407	combination	19	37.3	102	48.1
4407	stratigraphic	26	51	104	48.8
4407	structural	2	3.9	2	1
PLAY SUBTOTAL		47	92.2	208	97.9

Oil: Play 4410–"San Andres-Clearfork, Central Basin Platform and Ozona Arch;" Permian Basin

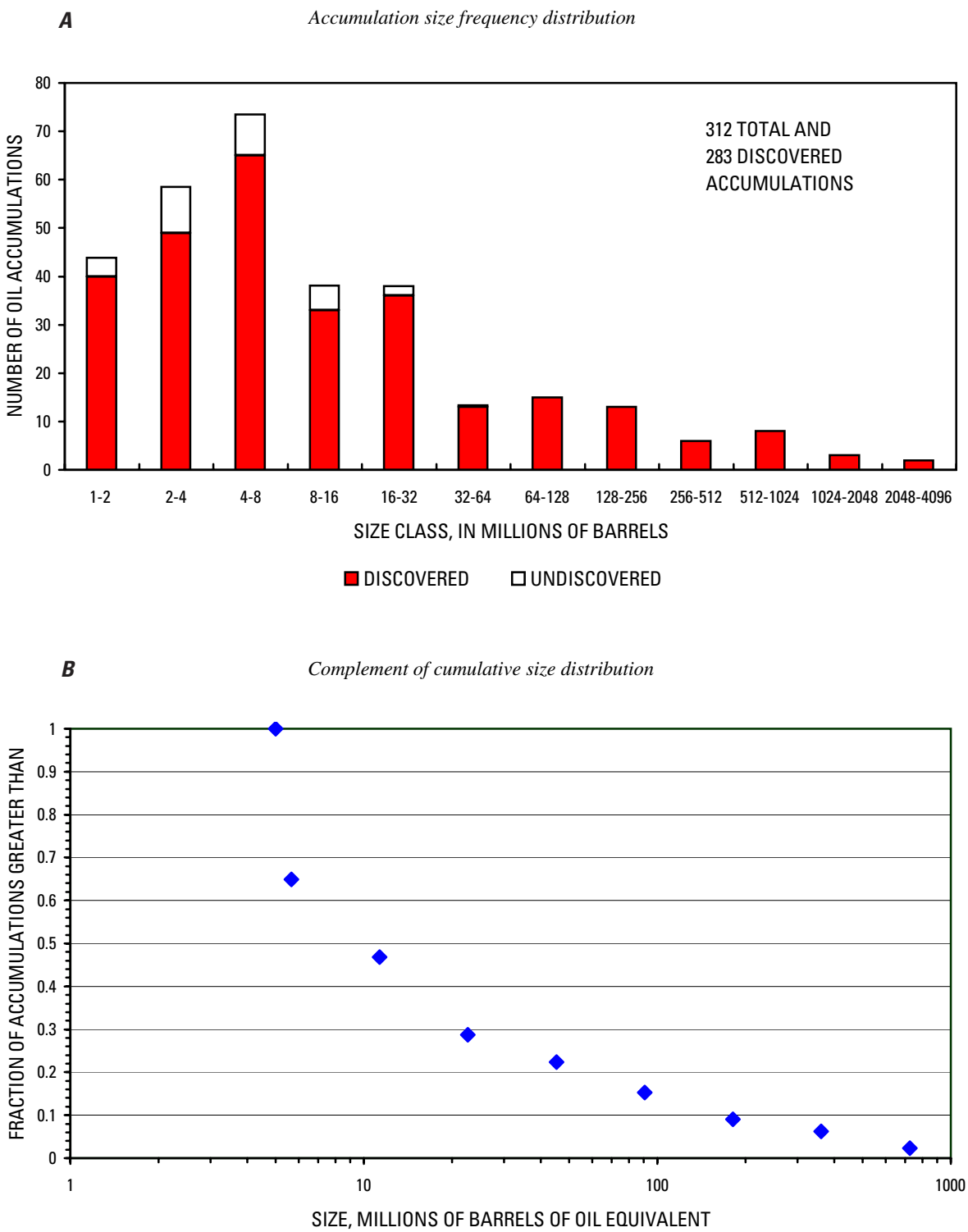

Figure 16. *A*. Size-frequency distribution of discovered and expected undiscovered oil accumulations where the minimum accumulation size is 1 million barrels of oil equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 5 million barrels of oil equivalent.

Oil: Play 4410–"San Andres-Clearfork, Central Basin Platform and Ozona Arch;" Permian Basin

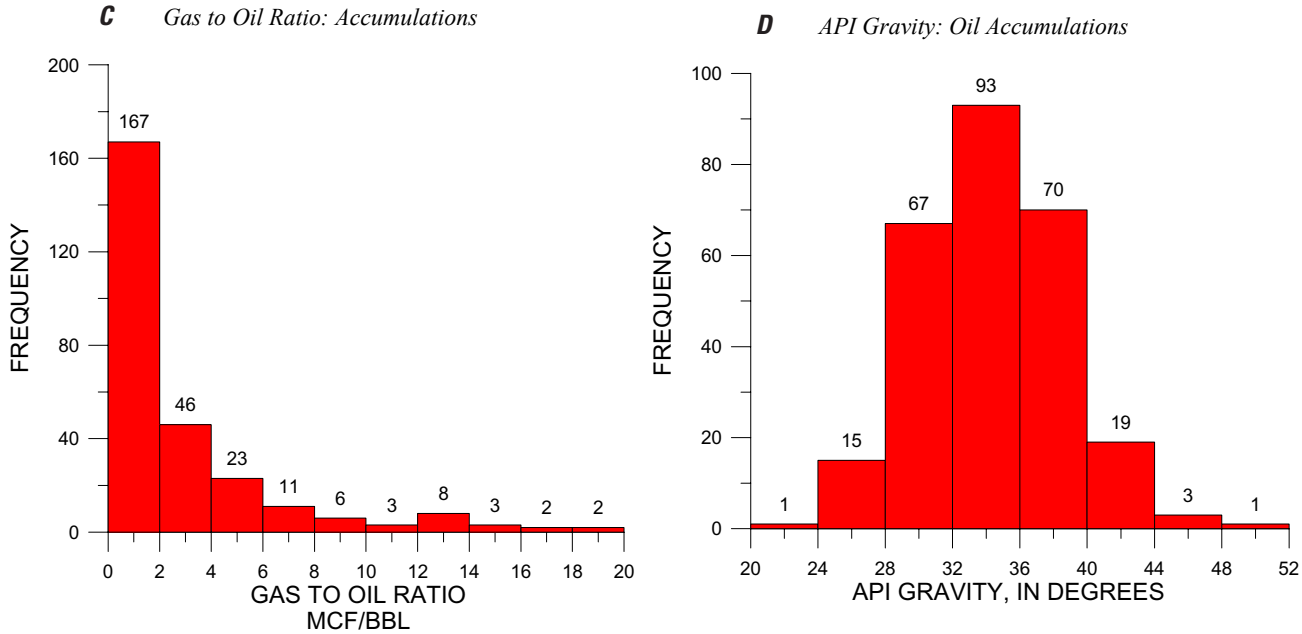

Figure 16. Continued. *C*. Histogram of gas to oil ratios, in thousands of cubic feet per barrel, of discovered oil accumulations . *D*. Histogram of API gravities of discovered oil accumulations.

Table 20. Numbers of discovered oil accumulations and volume of known oil recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Oil Accumulations Number	Oil Accumulations Percent of Play	Oil Volume MMBO	Oil Volume Percent of Play
		By lithology				
4410	chert	limestone	1	0.4	1	0
4410	dolomite	anhydrite	2	0.7	795	6.6
4410	dolomite	dolomite	1	0.4	11	0.1
4410	dolomite	limestone	38	14	2,862	23.6
4410	dolomite		96	35.4	1,901	15.7
4410	dolomite	sandstone	30	11.1	1,428	11.8
4410	dolomite	shale	1	0.4	6	0
4410	dolomite	siltstone	1	0.4	17	0.1
4410	limestone	chert	1	0.4	13	0.1
4410	limestone	dolomite	15	5.5	3,331	27.5
4410	limestone		23	8.5	194	1.6
4410	limestone	sandstone	3	1.1	959	7.9
4410	sandstone	dolomite	14	5.2	152	1.3
4410	sandstone	limestone	7	2.6	23	0.2
4410	sandstone		34	12.5	359	3
4410	sandstone	sandstone	1	0.4	9	0.1
4410	sandstone	shale	2	0.7	11	0.1
4410	sandstone	siltstone	1	0.4	56	0.5
PLAY TOTAL			271	100	12,127	100

USGS Play Number	Trap type	Number	Percent of Play	MMBO	Percent of Play
	By trap type				
4410	combination	226	83.4	12,008	99
4410	stratigraphic	9	3.3	37	0.3
4410	structural	23	8.5	56	0.5
PLAY SUBTOTAL		258	95.2	12,101	99.8

Oil: Play 4411–"San Andres-Clearfork, Northwestern and Eastern Shelves;" Permian Basin

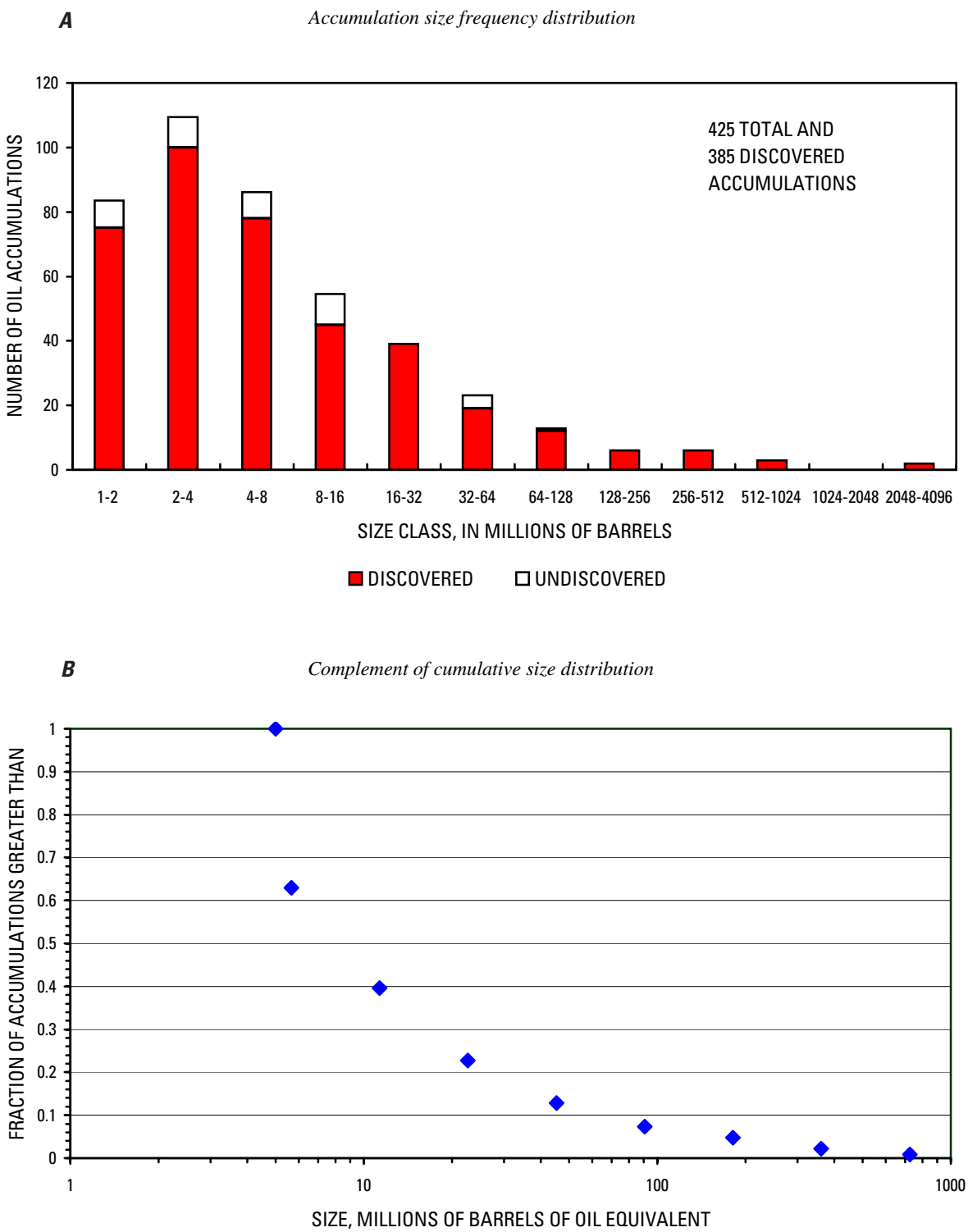

Figure 17. *A*. Size-frequency distribution of discovered and expected undiscovered oil accumulations where the minimum accumulation size is 1 million barrels of oil equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 5 million barrels of oil equivalent.

Oil: Play 4411–"San Andres-Clearfork, Northwestern and Eastern Shelves;" Permian Basin

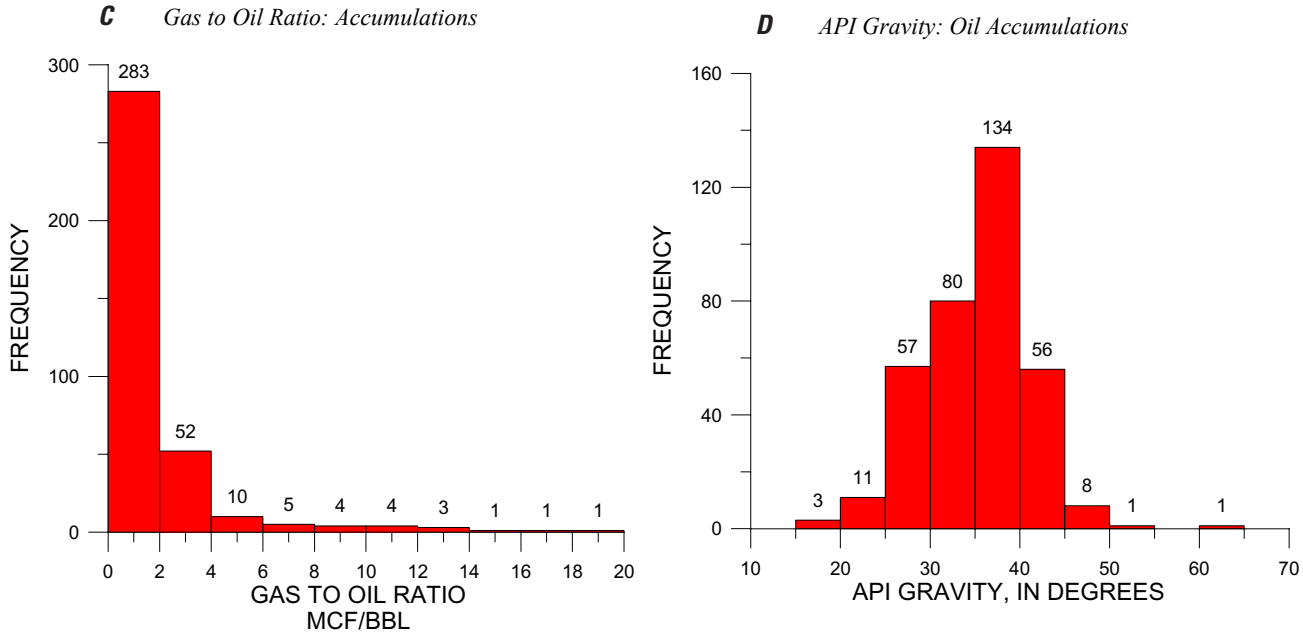

Figure 17. Continued. *C.* Histogram of gas to oil ratios, in thousands of cubic feet per barrel, of discovered oil accumulations . *D.* Histogram of API gravities of discovered oil accumulations.

Table 21. Numbers of discovered oil accumulations and volume of known oil recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Oil Accumulations Number	Oil Accumulations Percent of Play	Oil Volume MMBO	Oil Volume Percent of Play
		By lithology				
4411	dolomite	anhydrite	14	3.8	167	1.6
4411	dolomite	dolomite	2	0.5	15	0.1
4411	dolomite	limestone	30	8.2	5,745	54.1
4411	dolomite		108	29.7	1,785	16.8
4411	dolomite	sandstone	20	5.5	653	6.2
4411	limestone	dolomite	17	4.7	376	3.5
4411	limestone	limestone	1	0.3	2	0
4411	limestone		77	21.2	348	3.3
4411	limestone	sandstone	4	1.1	17	0.2
4411	sandstone	anhydrite	2	0.5	7	0.1
4411	sandstone	dolomite	20	5.5	1,146	10.8
4411	sandstone	limestone	1	0.3	5	0
4411	sandstone		68	18.7	349	3.3
PLAY TOTAL			364	100	10,613	100

USGS Play Number	Trap type	Number	Percent of Play	MMBO	Percent of Play
	By trap type				
4411	combination	191	52.5	9,372	88.3
4411	stratigraphic	97	26.6	1,012	9.5
4411	structural	28	7.7	129	1.2
PLAY SUBTOTAL		316	86.8	10,513	99

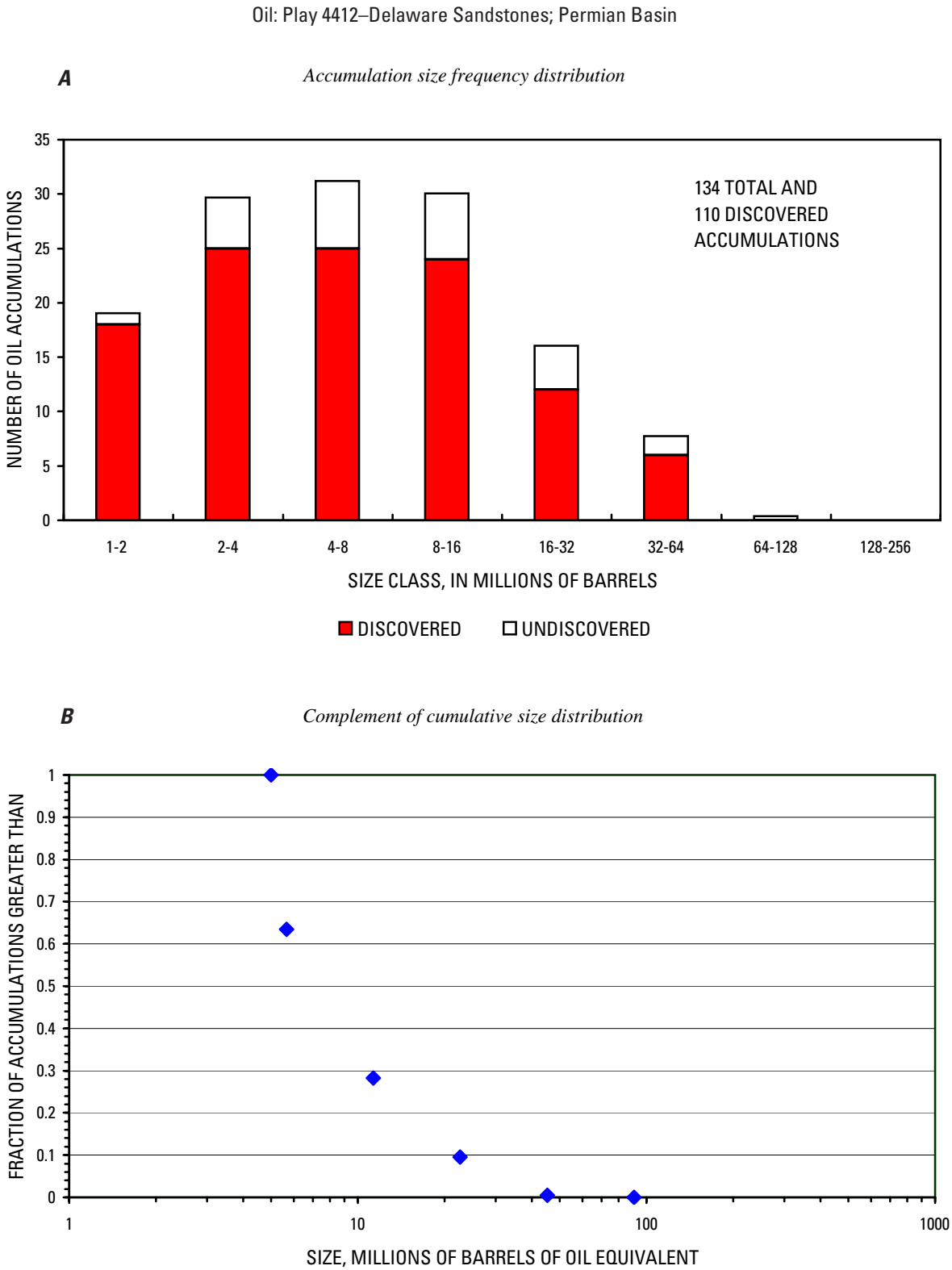

Figure 18. *A*. Size-frequency distribution of discovered and expected undiscovered oil accumulations where the minimum accumulation size is 1 million barrels of oil equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 5 million barrels of oil equivalent.

Oil: Play 4412–Delaware Sandstones; Permian Basin

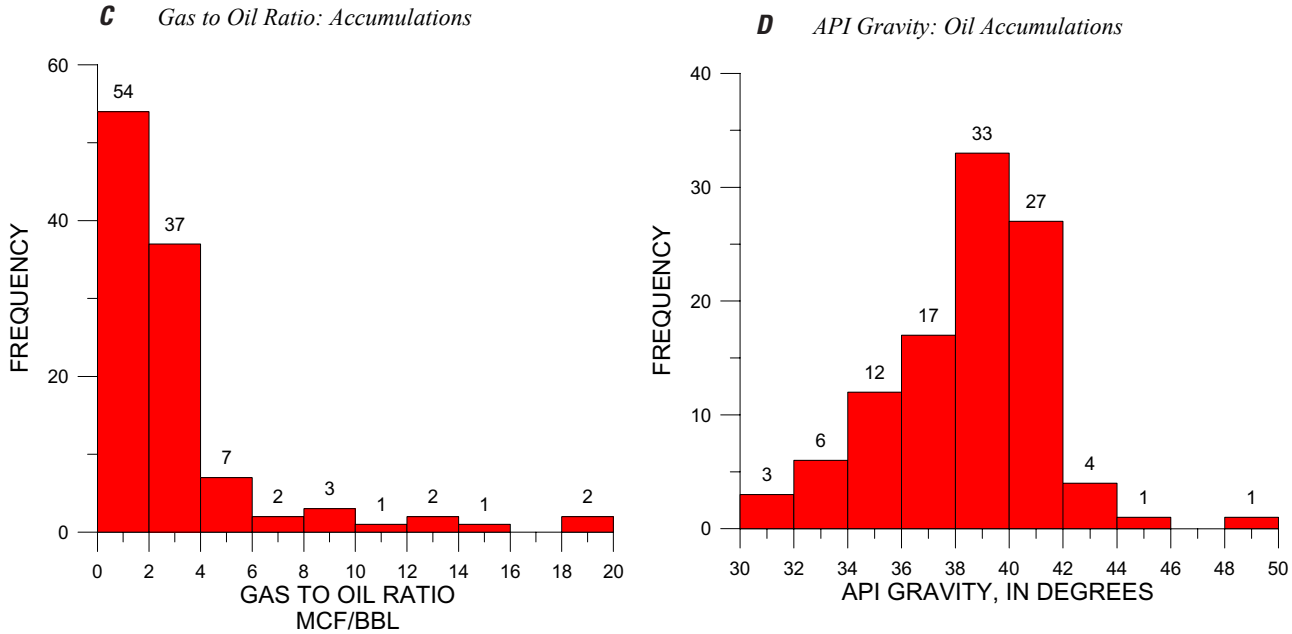

Figure 18. Continued. *C*. Histogram of gas to oil ratios, in thousands of cubic feet per barrel, of discovered oil accumulations . *D*. Histogram of API gravities of discovered oil accumulations.

Table 22. Numbers of discovered oil accumulations and volume of known oil recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Oil Accumulations: Number	Oil Accumulations: Percent of Play	Oil Volume: MMBO	Oil Volume: Percent of Play
		By lithology				
4412	dolomite		3	2.8	19	4
4412	limestone		3	2.8	6	1.3
4412	sandstone	dolomite	1	0.9	2	0.4
4412	sandstone	limestone	3	2.8	8	1.7
4412	sandstone		99	90.8	431	92.7
PLAY TOTAL			109	100	465	100

USGS Play Number	Trap type	Number	Percent of Play	MMBO	Percent of Play
	By trap type				
4412	combination	46	42.2	238	51.1
4412	stratigraphic	26	23.9	135	29
4412	structural	1	0.9	3	0.6
PLAY SUBTOTAL		73	67	375	80.7

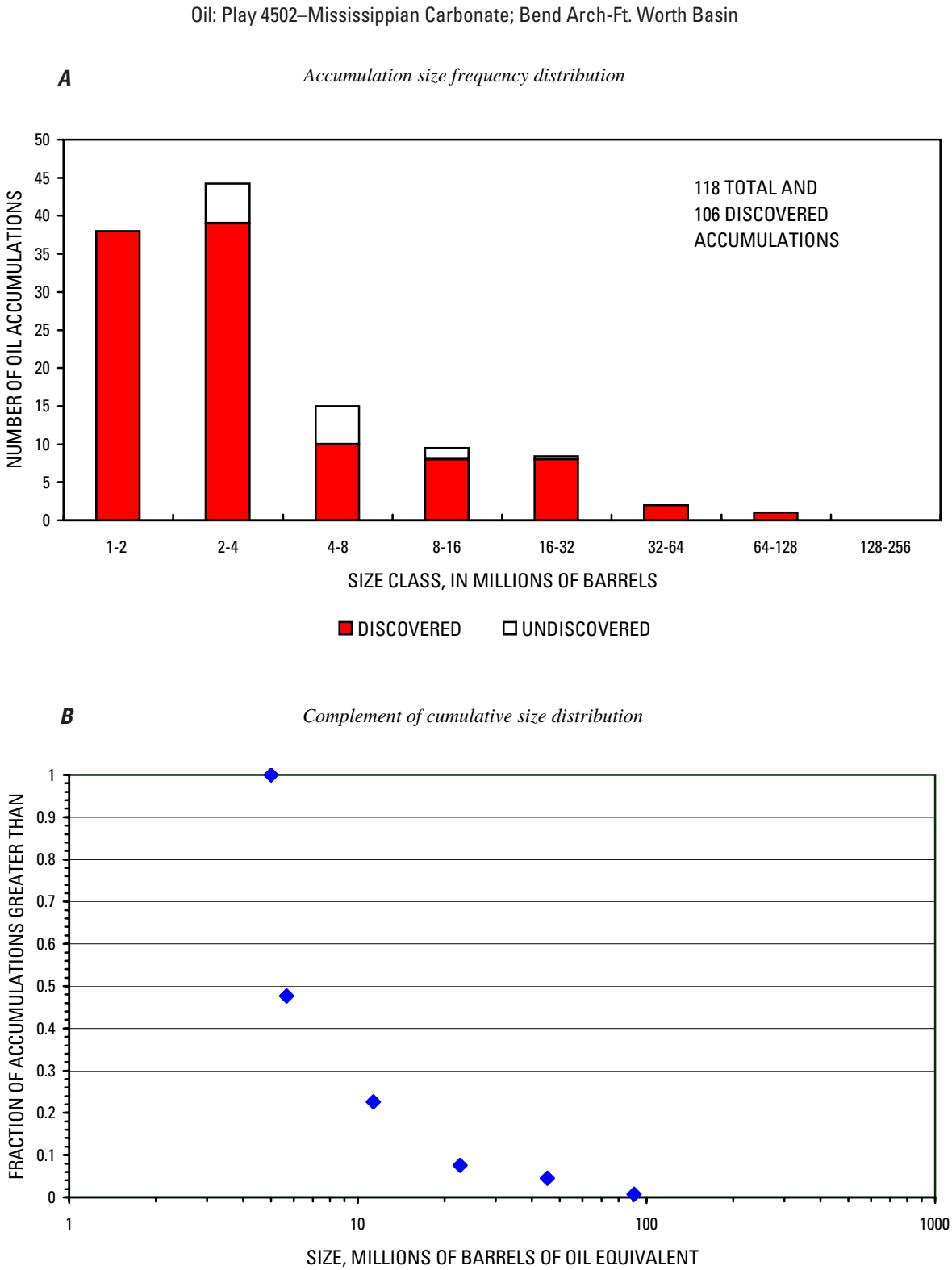

Figure 19. *A*. Size-frequency distribution of discovered and expected undiscovered oil accumulations where the minimum accumulation size is 1 million barrels of oil equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 5 million barrels of oil equivalent.

Oil: Play 4502–Mississippian Carbonate; Bend Arch-Ft. Worth Basin

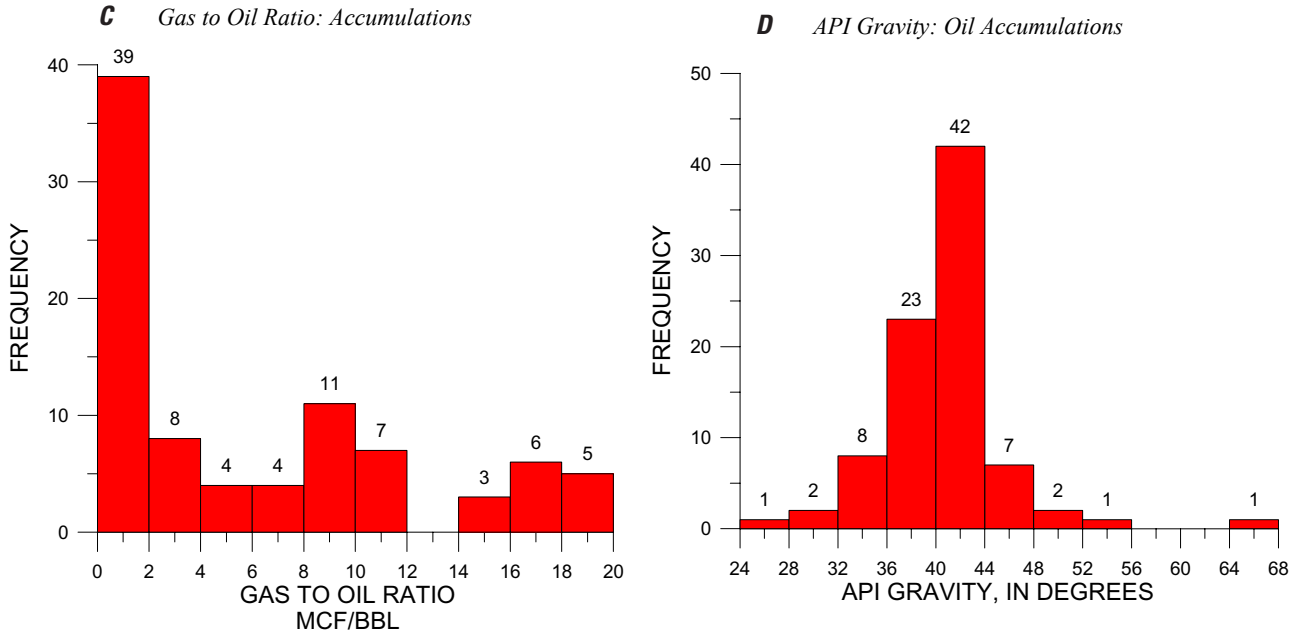

Figure 19. Continued. *C*. Histogram of gas to oil ratios, in thousands of cubic feet per barrel, of discovered oil accumulations . *D*. Histogram of API gravities of discovered oil accumulations.

Table 23. Numbers of discovered oil accumulations and volume of known oil recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

Oil Play Number	Primary Lithology	Secondary Lithology	Oil Accumulations Number	Oil Accumulations Percent of Play	Oil Volume MMBO	Oil Volume Percent of Play
		By lithology				
4504	conglomerate	limestone	2	2.3	1	0.4
4504	conglomerate		49	56.3	150	69.4
4504	conglomerate	sandstone	9	10.3	32	14.8
4504	limestone		8	9.2	10	4.5
4504	sandstone	conglomerate	2	2.3	2	0.7
4504	sandstone		17	19.5	22	10.3
PLAY TOTAL			87	100	216	100

Oil Play Number	Trap type	Number	Percent of Play	MMBO	Percent of Play
	By trap type				
4504	combination	36	41.4	119	54.9
4504	stratigraphic	10	11.5	29	13.7
4504	structural	28	32.2	58	26.8
PLAY SUBTOTAL		74	85.1	206	95.4

Oil: Play 4504–Lower Pennsylvanian (Bend) Sandstone and Conglomerate; Bend Arch-Ft. Worth Basin

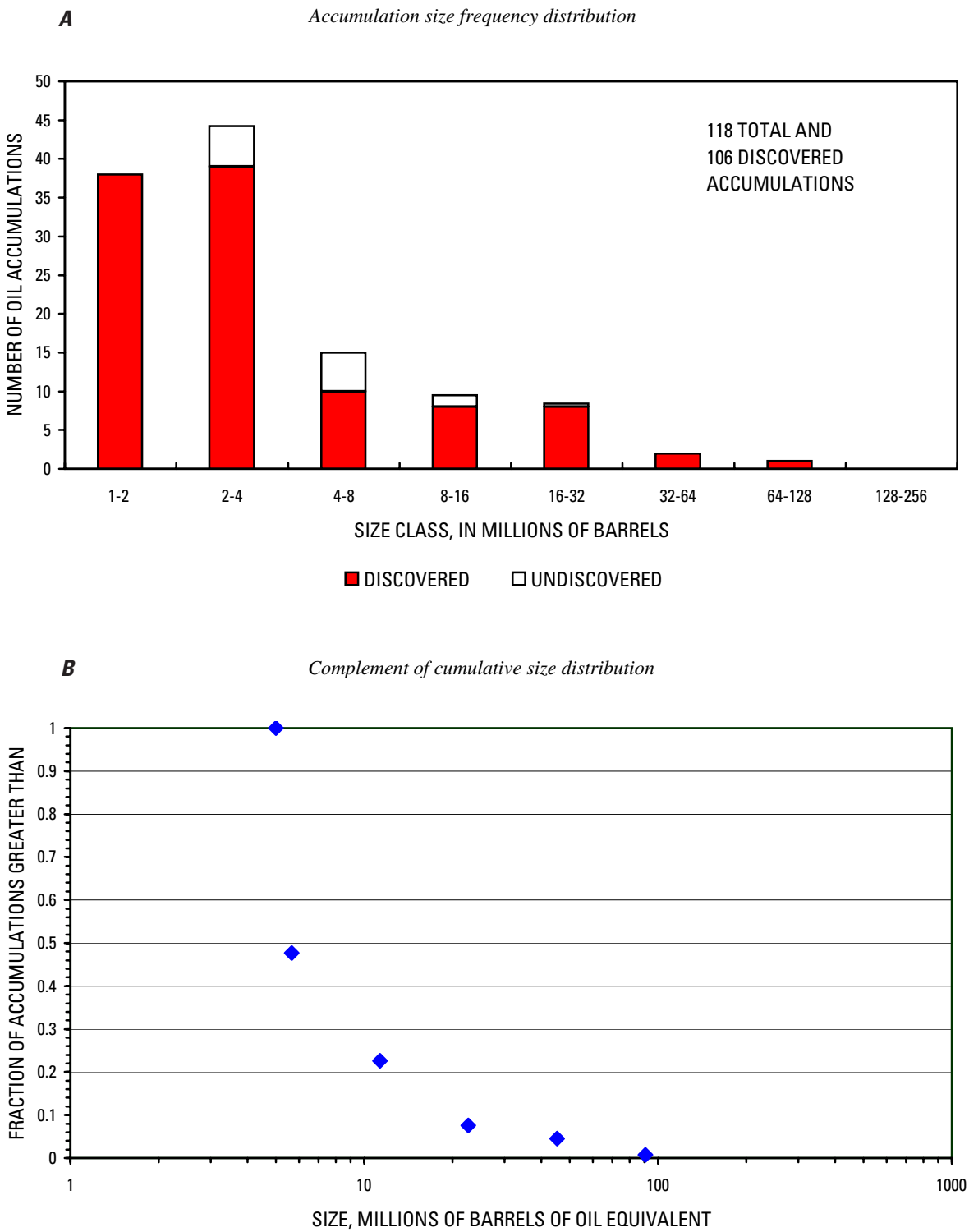

Figure 20. *A*. Size-frequency distribution of discovered and expected undiscovered oil accumulations where the minimum accumulation size is 1 million barrels of oil equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 5 million barrels of oil equivalent.

Oil: Play 4504–Lower Pennsylvanian (Bend) Sandstone and Conglomerate; Bend Arch-Ft. Worth Basin

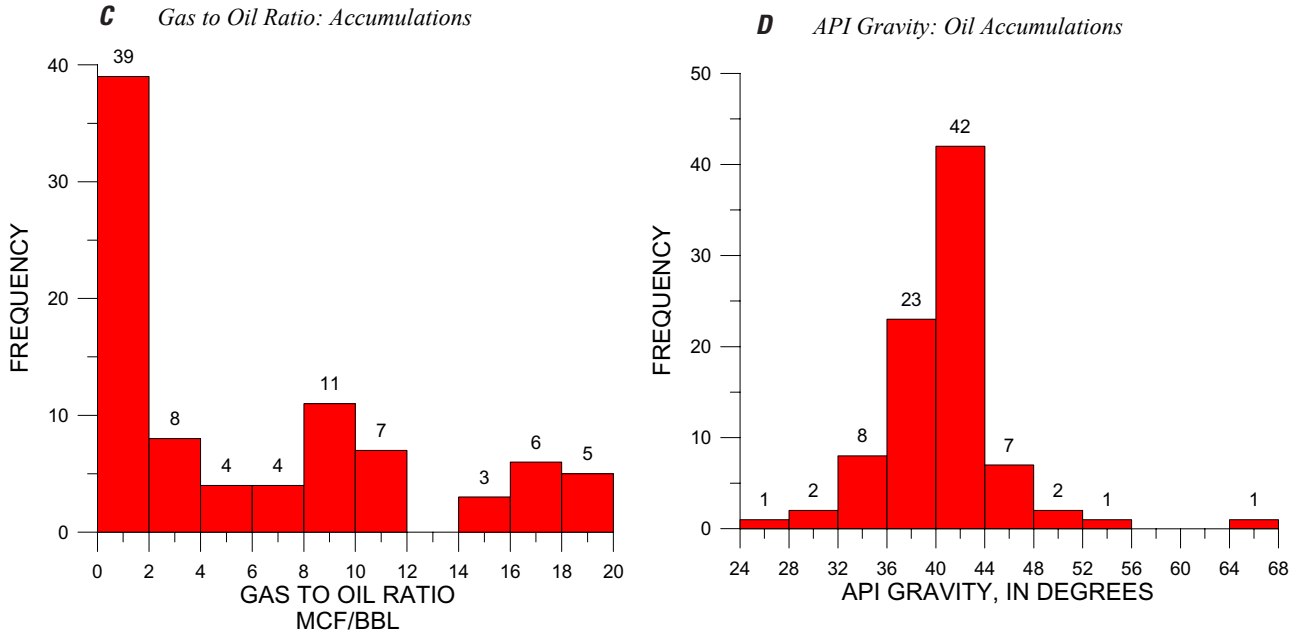

Figure 20. Continued. *C*. Histogram of gas to oil ratios, in thousands of cubic feet per barrel, of discovered oil accumulations . *D*. Histogram of API gravities of discovered oil accumulations.

Table 24. Numbers of discovered oil accumulations and volume of known oil recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

Oil Play Number	Primary Lithology	Secondary Lithology	Oil Accumulations Number	Oil Accumulations Percent of Play	Oil Volume MMBO	Oil Volume Percent of Play
		By lithology				
4504	conglomerate	limestone	2	2.3	1	0.4
4504	conglomerate		49	56.3	150	69.4
4504	conglomerate	sandstone	9	10.3	32	14.8
4504	limestone		8	9.2	10	4.5
4504	sandstone	conglomerate	2	2.3	2	0.7
4504	sandstone		17	19.5	22	10.3
PLAY TOTAL			87	100	216	100

Oil Play Number	Trap type	Number	Percent of Play	MMBO	Percent of Play
	By trap type				
4504	combination	36	41.4	119	54.9
4504	stratigraphic	10	11.5	29	13.7
4504	structural	28	32.2	58	26.8
PLAY SUBTOTAL		74	85.1	206	95.4

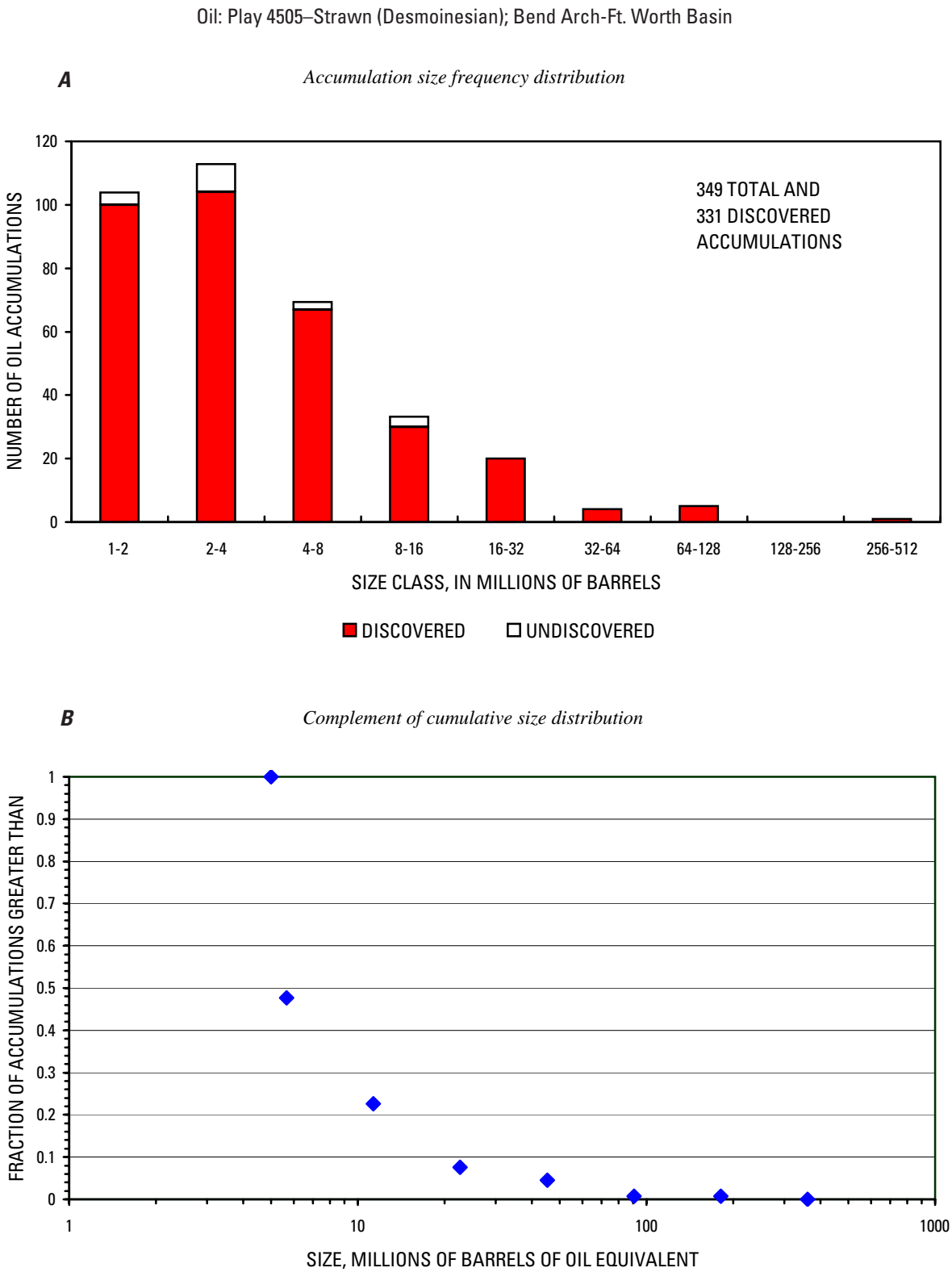

Figure 21. *A*. Size-frequency distribution of discovered and expected undiscovered oil accumulations where the minimum accumulation size is 1 million barrels of oil equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 5 million barrels of oil equivalent.

Oil: Play 4505–Strawn (Desmoinesian); Bend Arch-Ft. Worth Basin

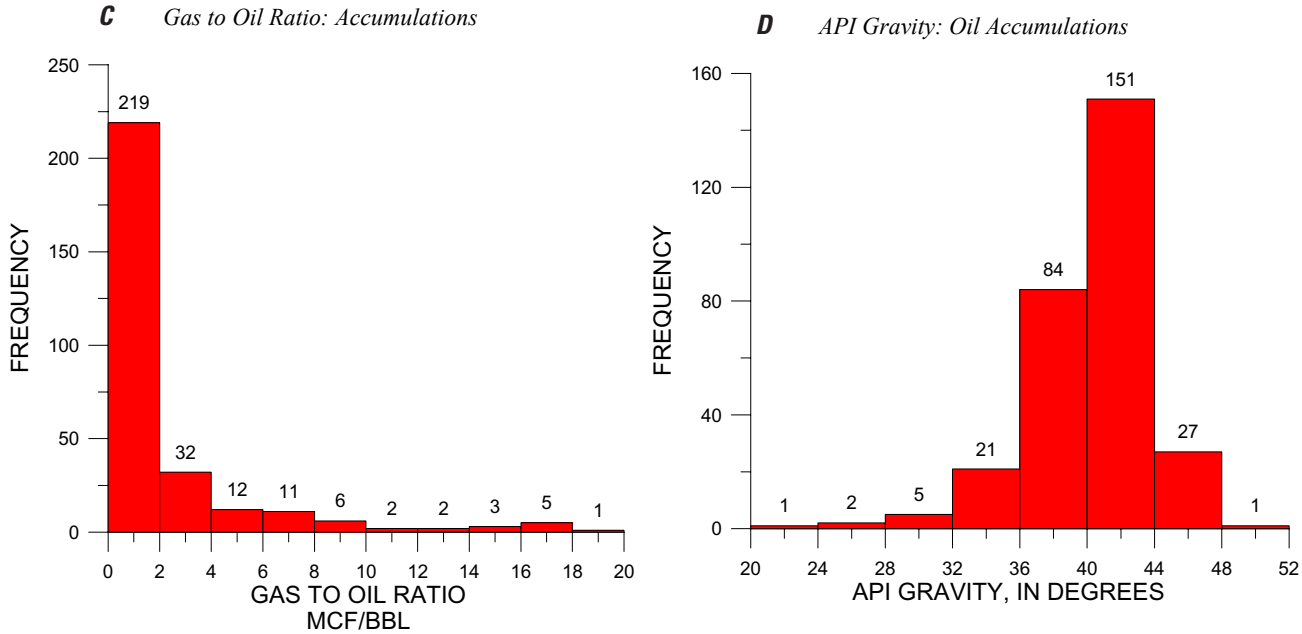

Figure 21. Continued. *C*. Histogram of gas to oil ratios, in thousands of cubic feet per barrel, of discovered oil accumulations . *D*. Histogram of API gravities of discovered oil accumulations.

Table 25. Numbers of discovered oil accumulations and volume of known oil recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

Oil Play Number	Primary Lithology	Secondary Lithology	Oil Accumulations Number	Oil Accumulations Percent of Play	Oil Volume MMBO	Oil Volume Percent of Play
		By lithology				
4505	conglomerate	limestone	11	3.8	22	1.4
4505	conglomerate		13	4.4	33	2.1
4505	conglomerate	sandstone	3	1	4	0.3
4505	granite wash		1	0.3	2	0.1
4505	limestone	conglomerate	6	2	33	2.1
4505	limestone		50	17.1	92	5.9
4505	limestone	sandstone	11	3.8	108	6.9
4505	sandstone	conglomerate	1	0.3	81	5.2
4505	sandstone	limestone	10	3.4	296	18.7
4505	sandstone		185	63.1	899	57
4505	sandstone	shale	2	0.7	8	0.5
PLAY TOTAL			293	100	1,578	100

Oil Play Number	Trap type	Number	Percent of Play	MMBO	Percent of Play
	By trap type				
4505	combination	172	58.7	1,244	78.8
4505	stratigraphic	46	15.7	133	8.4
4505	structural	59	20.1	180	11.4
PLAY SUBTOTAL		277	94.5	1,557	98.6

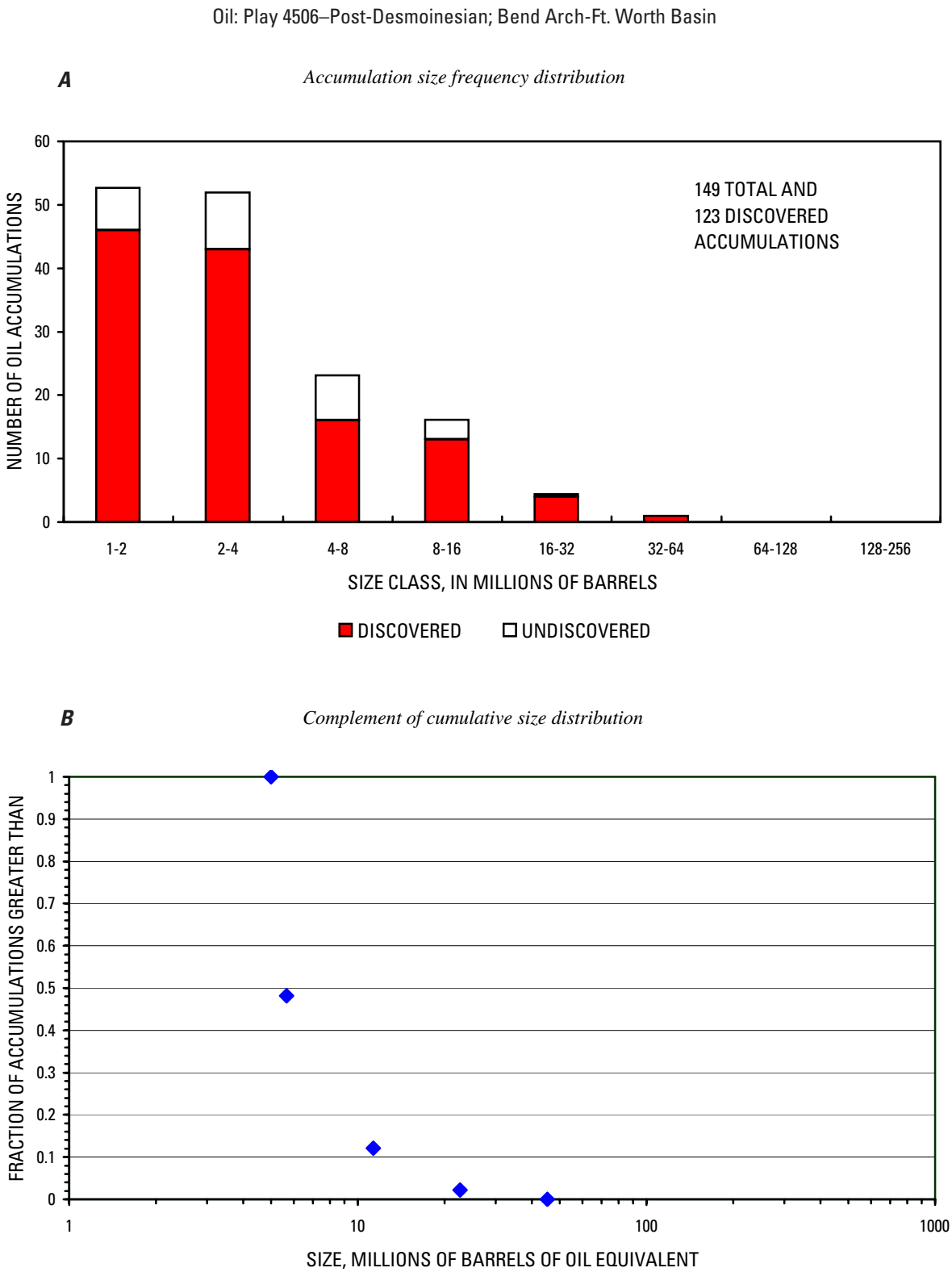

Figure 22. *A*. Size-frequency distribution of discovered and expected undiscovered oil accumulations where the minimum accumulation size is 1 million barrels of oil equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 5 million barrels of oil equivalent.

Oil: Play 4506–Post-Desmoinesian; Bend Arch-Ft. Worth Basin

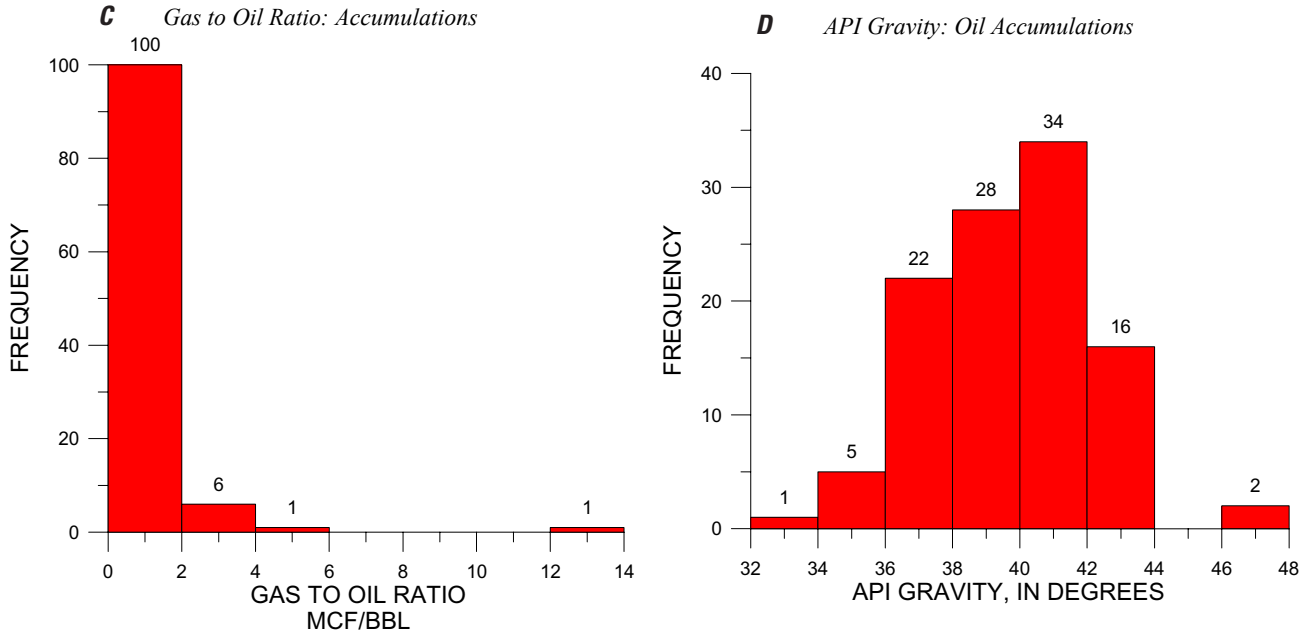

Figure 22. Continued. *C.* Histogram of gas to oil ratios, in thousands of cubic feet per barrel, of discovered oil accumulations . *D.* Histogram of API gravities of discovered oil accumulations.

Table 26. Numbers of discovered oil accumulations and volume of known oil recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Oil Accumulations Number	Oil Accumulations Percent of Play	Oil Volume MMBO	Oil Volume Percent of Play
		By lithology				
4506	granite wash	conglomerate	1	0.9	3	0.8
4506	limestone		21	19.4	91	26.2
4506	limestone	sandstone	6	5.6	15	4.2
4506	sandstone	limestone	9	8.3	28	7.9
4506	sandstone		70	64.8	210	60.5
4506	sandstone	shale	1	0.9	1	0.4
PLAY TOTAL			108	100	348	100

USGS Play Number	Trap type	Number	Percent of Play	MMBO	Percent of Play
	By trap type				
4506	combination	56	51.9	165	47.4
4506	stratigraphic	37	34.3	118	34
4506	structural	9	8.3	56	16
PLAY SUBTOTAL		102	94.5	339	97.4

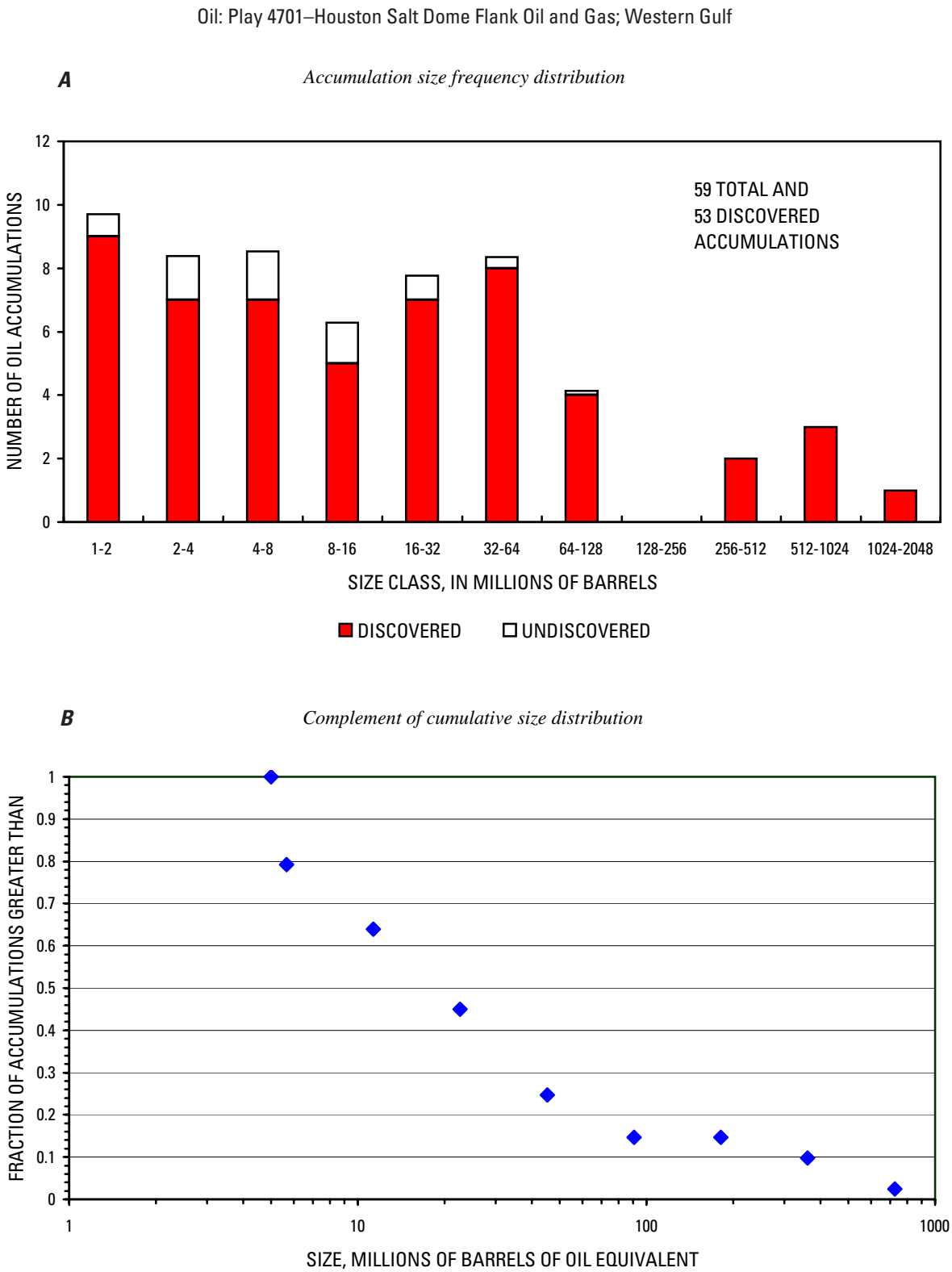

Figure 23. *A*. Size-frequency distribution of discovered and expected undiscovered oil accumulations where the minimum accumulation size is 1 million barrels of oil equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 5 million barrels of oil equivalent.

Oil: Play 4701–Houston Salt Dome Flank Oil and Gas; Western Gulf

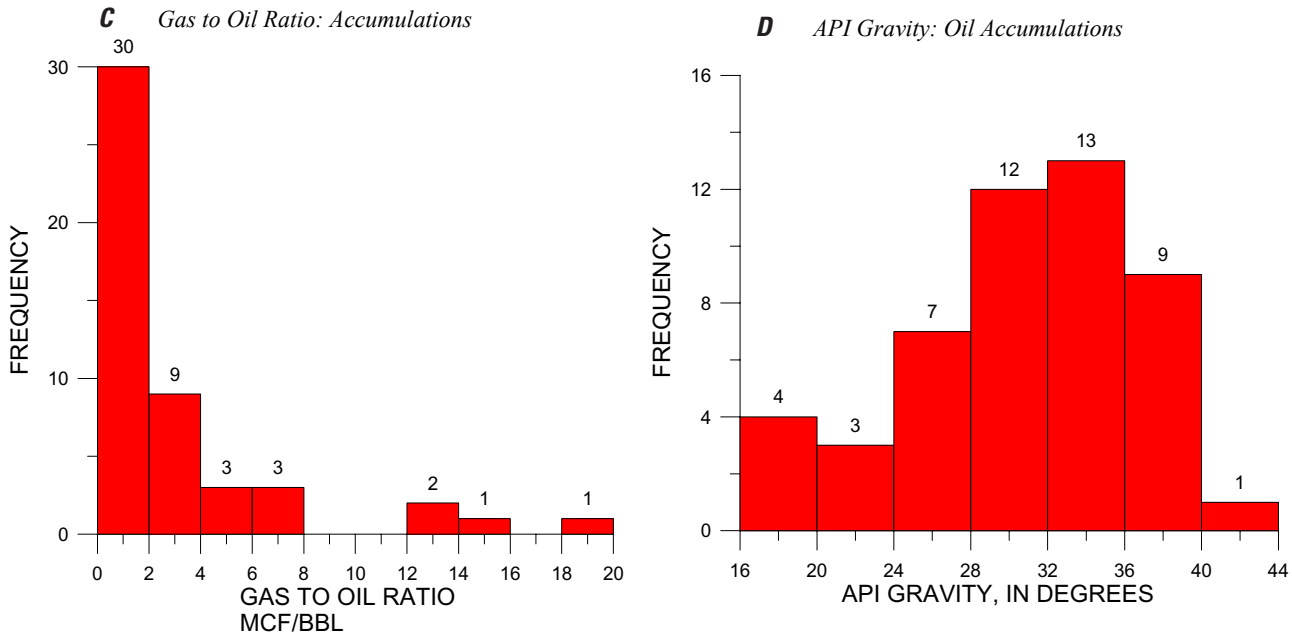

Figure 23. Continued. *C*. Histogram of gas to oil ratios, in thousands of cubic feet per barrel, of discovered oil accumulations . *D*. Histogram of API gravities of discovered oil accumulations.

Table 27. Numbers of discovered oil accumulations and volume of known oil recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Oil Accumulations Number	Oil Accumulations Percent of Play	Oil Volume MMBO	Oil Volume Percent of Play
		By lithology				
4701	limestone	sandstone	2	4.1	47	1.3
4701	sandstone		47	95.9	3,490	98.7
PLAY TOTAL			49	100	3,537	100
USGS Play Number	**Trap type**		**Number**	**Percent of Play**	**MMBO**	**Percent of Play**
		By trap type				
4701	combination		34	69.4	3,462	97.9
4701	structural		11	22.4	63	1.8
PLAY SUBTOTAL			45	91.8	3,525	99.7

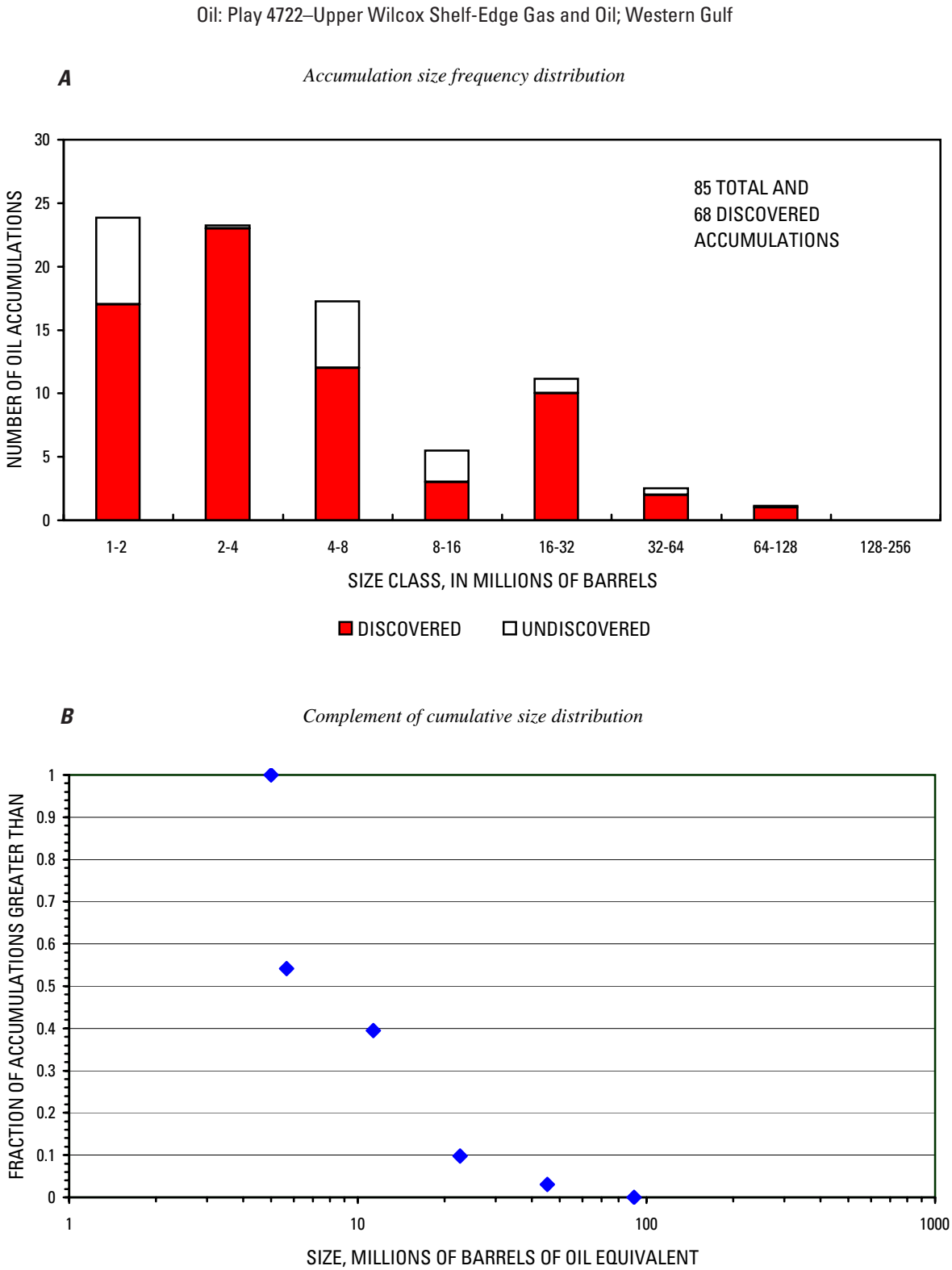

Figure 24. *A*. Size-frequency distribution of discovered and expected undiscovered oil accumulations where the minimum accumulation size is 1 million barrels of oil equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 5 million barrels of oil equivalent.

Oil: Play 4722–Upper Wilcox Shelf-Edge Gas and Oil; Western Gulf

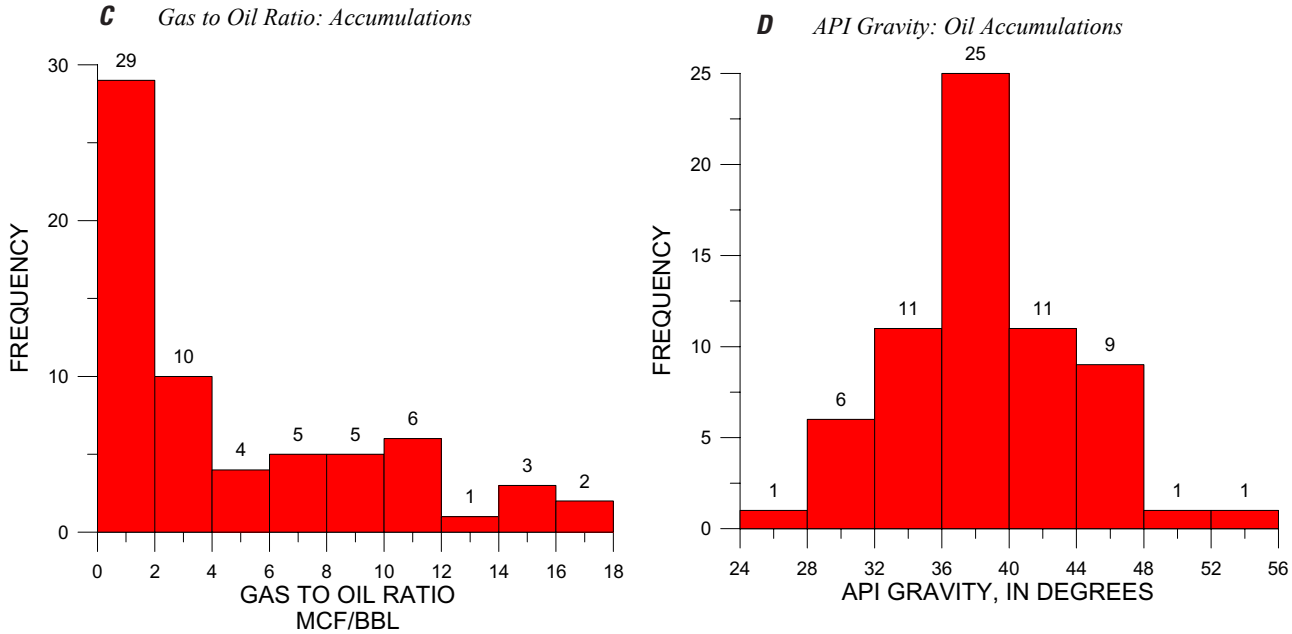

Figure 24. Continued. *C*. Histogram of gas to oil ratios, in thousands of cubic feet per barrel, of discovered oil accumulations . *D*. Histogram of API gravities of discovered oil accumulations.

Table 28. Numbers of discovered oil accumulations and volume of known oil recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Oil Accumulations Number	Oil Accumulations Percent of Play	Oil Volume MMBO	Oil Volume Percent of Play
		By lithology				
4722	sandstone		65	100	271	100
PLAY TOTAL			65	100	271	100
USGS Play Number	**Trap type**		**Number**	**Percent of Play**	**MMBO**	**Percent of Play**
		By trap type				
4722	combination		24	36.9	108	39.7
4722	stratigraphic		0	0	0	0
4722	structural		32	49.2	154	56.8
PLAY SUBTOTAL			56	86.1	261	96.5

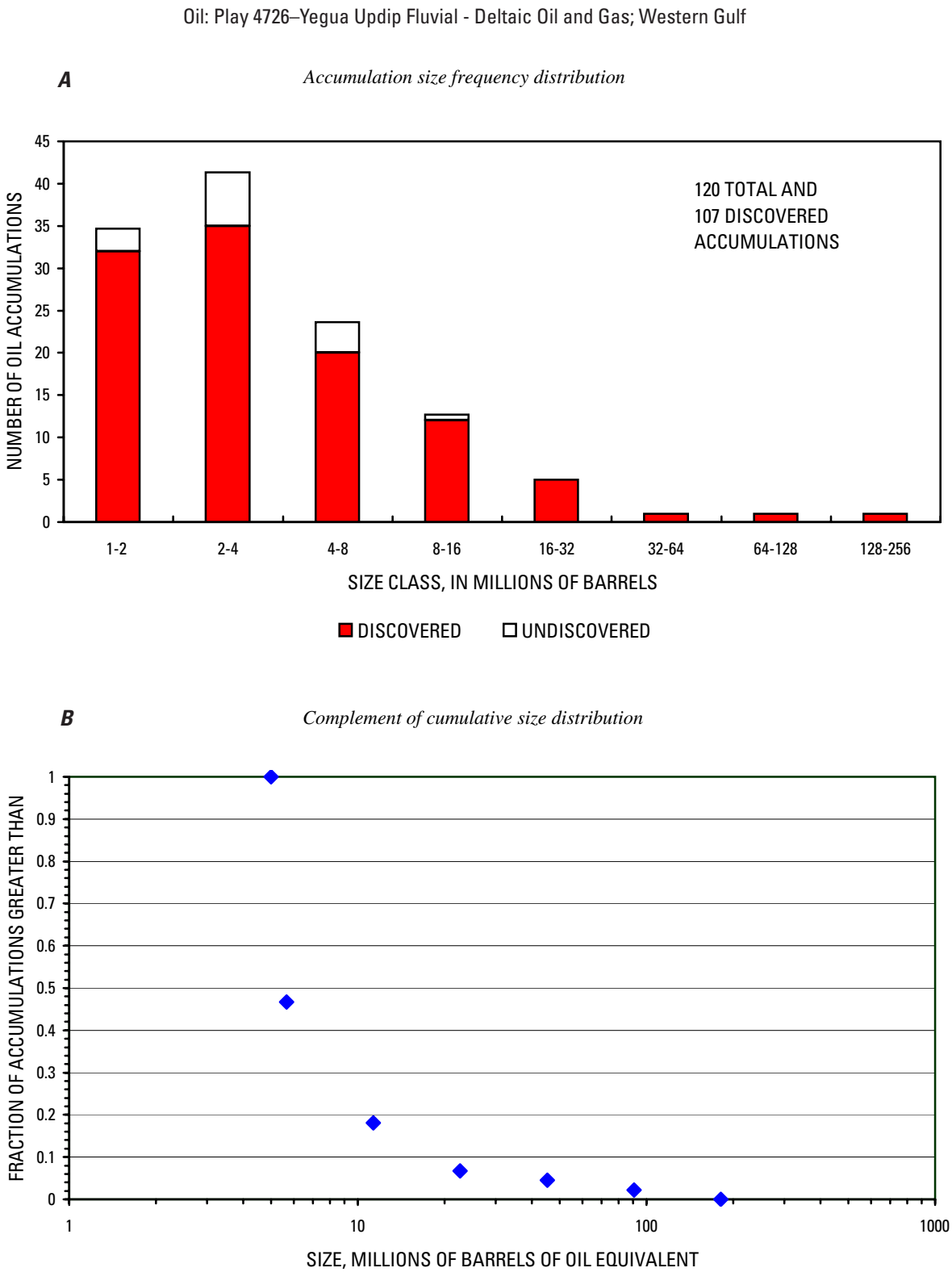

Figure 25. *A*. Size-frequency distribution of discovered and expected undiscovered oil accumulations where the minimum accumulation size is 1 million barrels of oil equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 5 million barrels of oil equivalent.

Oil: Play 4726–Yegua Updip Fluvial - Deltaic Oil and Gas; Western Gulf

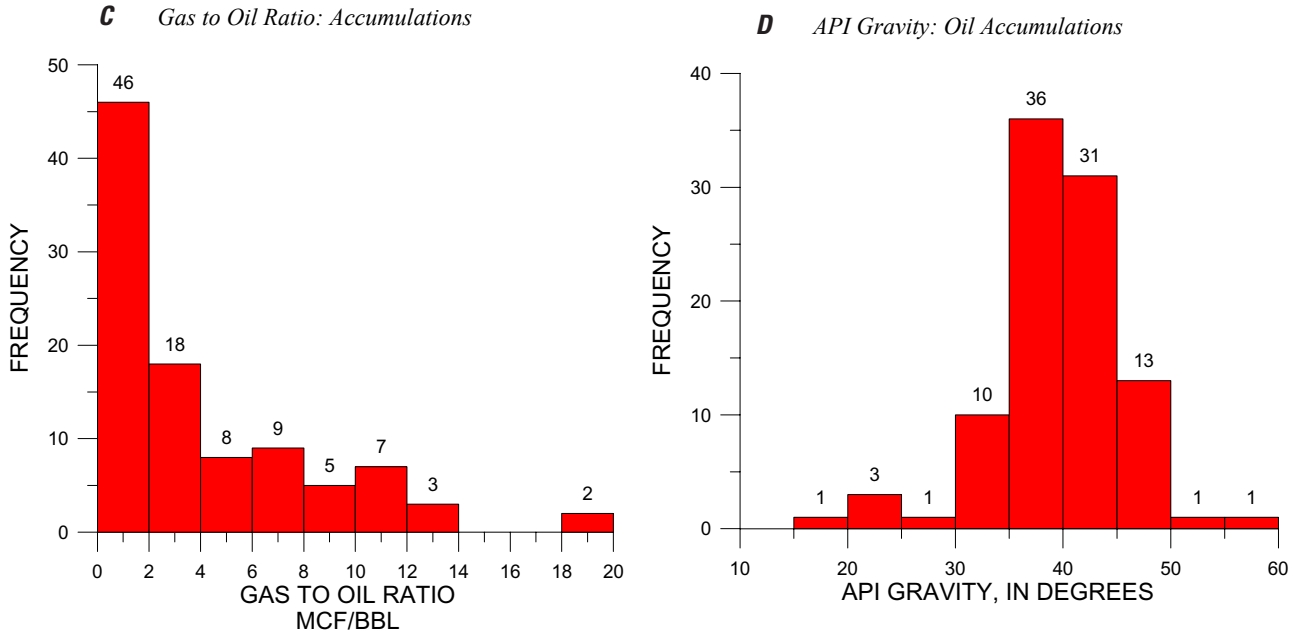

Figure 25. Continued. *C*. Histogram of gas to oil ratios, in thousands of cubic feet per barrel, of discovered oil accumulations . *D*. Histogram of API gravities of discovered oil accumulations.

Table 29. Numbers of discovered oil accumulations and volume of known oil recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Oil Accumulations Number	Oil Accumulations Percent of Play	Oil Volume MMBO	Oil Volume Percent of Play
		By lithology				
4726	sandstone		97	99	369	99.4
4726	sandstone	siltstone	1	1	2	0.6
PLAY TOTAL			98	100	371	100
USGS Play Number	**Trap type**		**Number**	**Percent of Play**	**MMBO**	**Percent of Play**
		By trap type				
4726	combination		44	44.9	264	71.2
4726	stratigraphic		10	10.2	14	3.8
4726	structural		31	31.6	72	19.4
PLAY SUBTOTAL			85	86.7	350	94.4

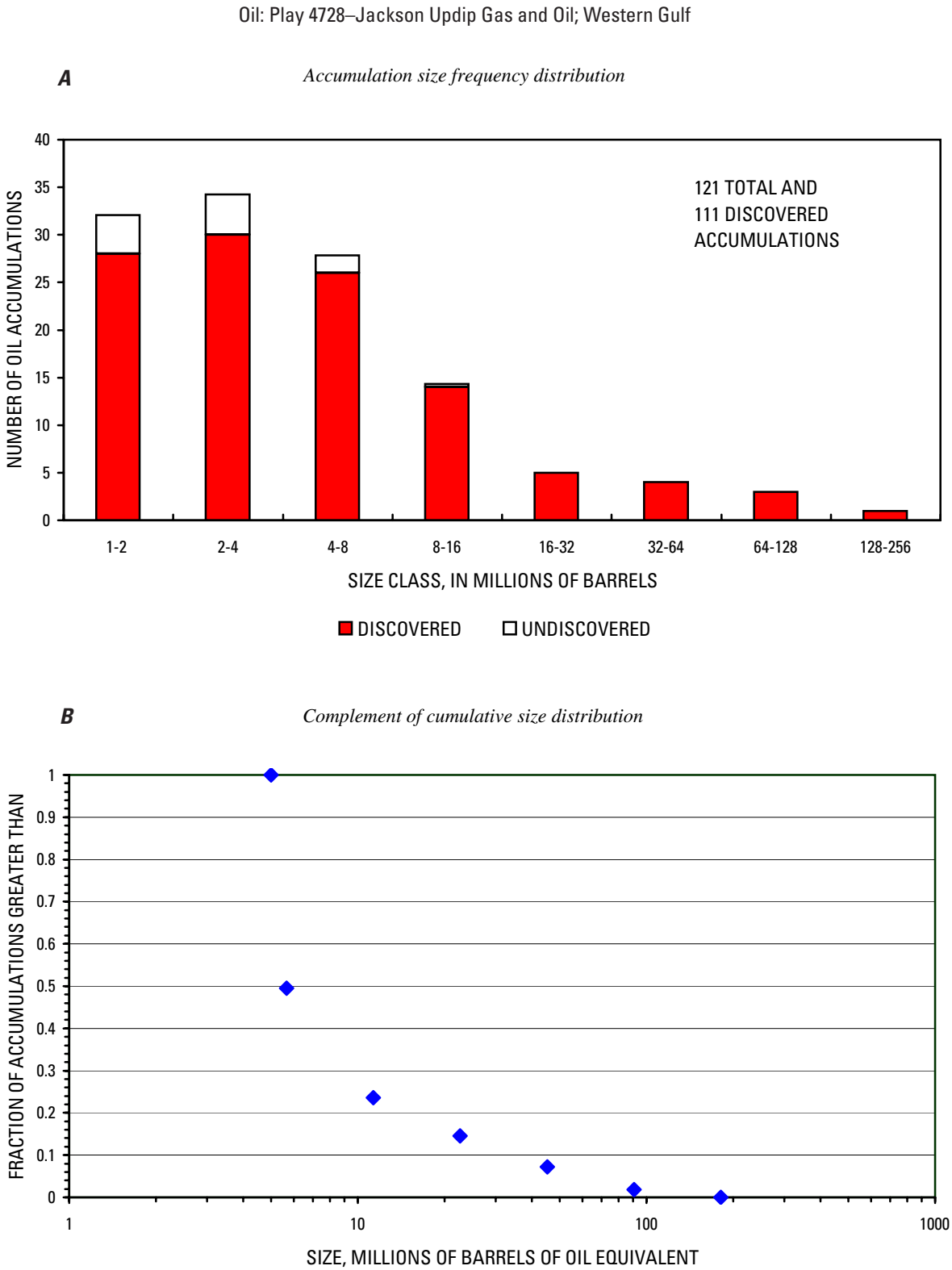

Figure 26. *A*. Size-frequency distribution of discovered and expected undiscovered oil accumulations where the minimum accumulation size is 1 million barrels of oil equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 5 million barrels of oil equivalent.

Oil: Play 4728–Jackson Updip Gas and Oil; Western Gulf

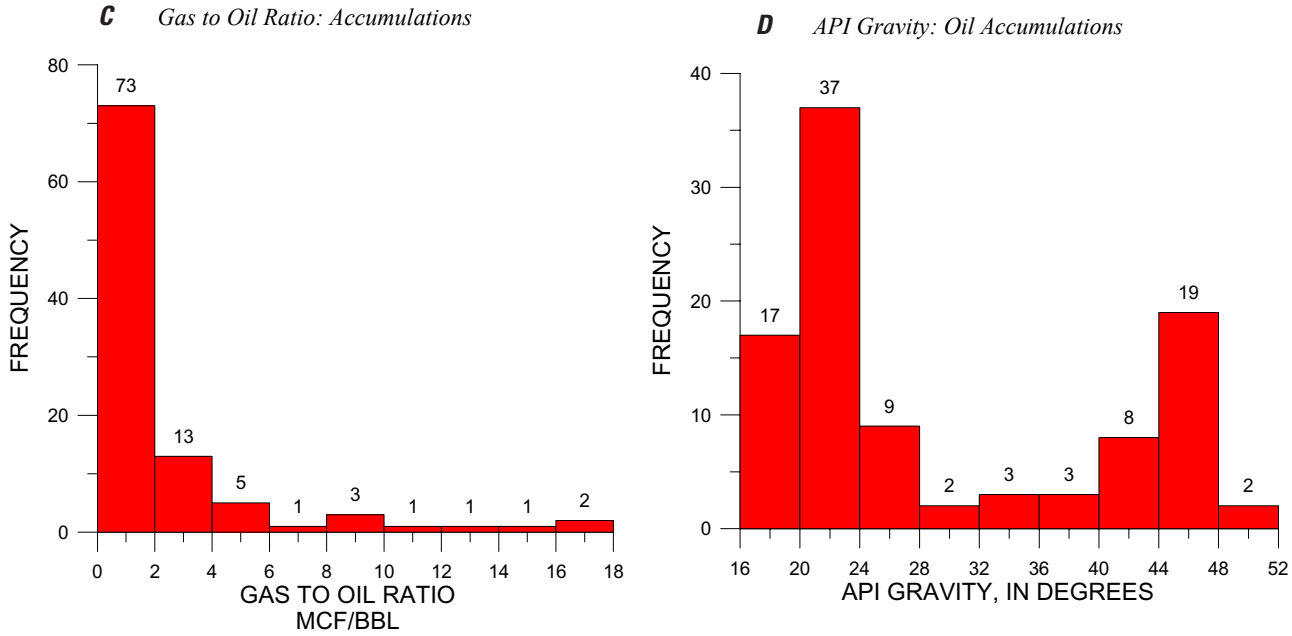

Figure 26. Continued. *C*. Histogram of gas to oil ratios, in thousands of cubic feet per barrel, of discovered oil accumulations . *D*. Histogram of API gravities of discovered oil accumulations.

Table 30. Numbers of discovered oil accumulations and volume of known oil recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Oil Accumulations Number	Oil Accumulations Percent of Play	Oil Volume MMBO	Oil Volume Percent of Play
		By lithology				
4728	sandstone		98	98	711	96.5
4728	sandstone	shale	2	2	26	3.5
PLAY TOTAL			100	100	736	100
USGS Play Number	**Trap type**		**Number**	**Percent of Play**	**MMBO**	**Percent of Play**
		By trap type				
4728	combination		54	54	520	70.7
4728	stratigraphic		26	26	165	22.4
4728	structural		18	18	48	6.6
PLAY SUBTOTAL			98	98	734	99.7

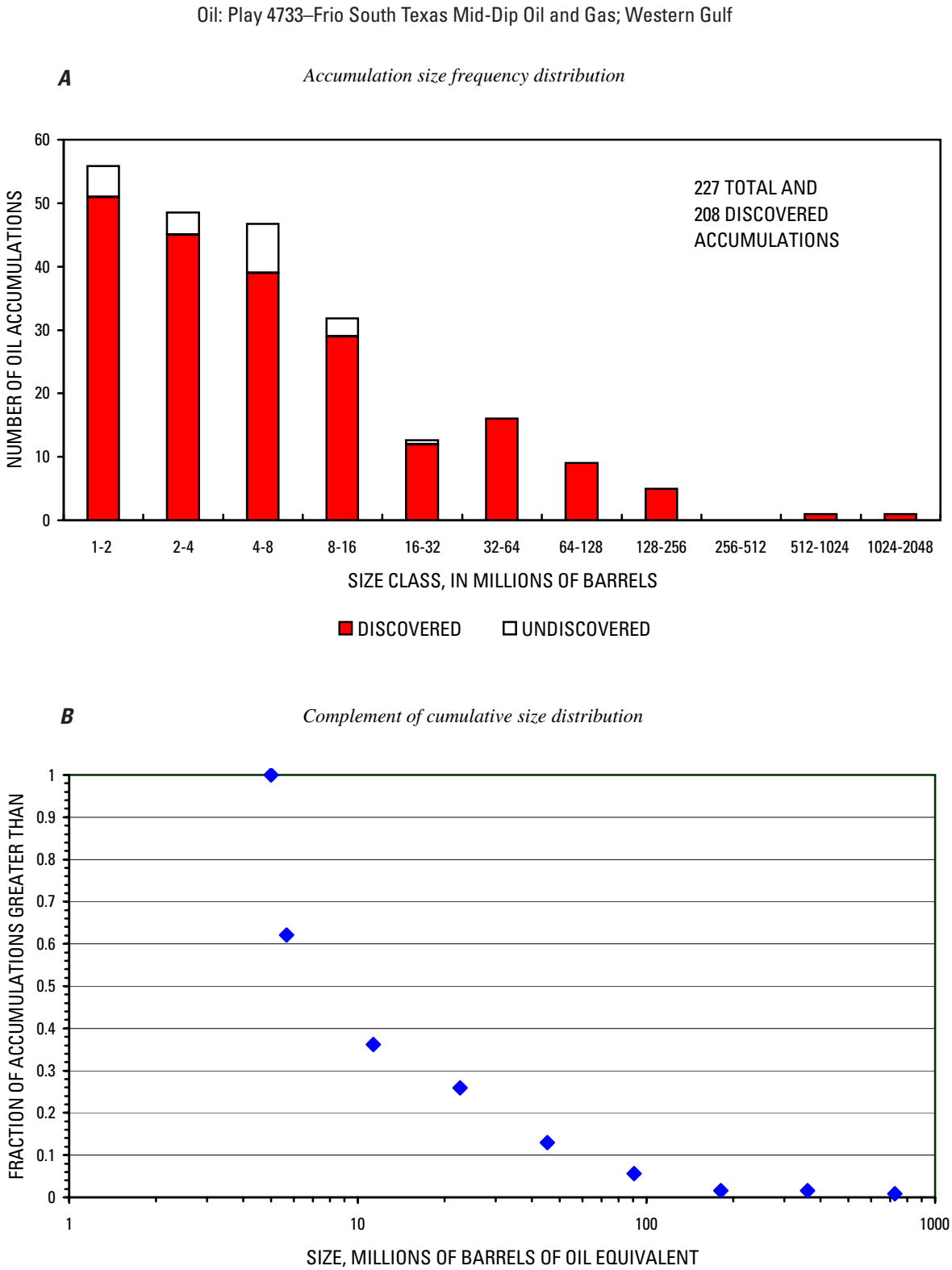

Figure 27. *A*. Size-frequency distribution of discovered and expected undiscovered oil accumulations where the minimum accumulation size is 1 million barrels of oil equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 5 million barrels of oil equivalent.

Oil: Play 4733–Frio South Texas Mid-Dip Oil and Gas; Western Gulf

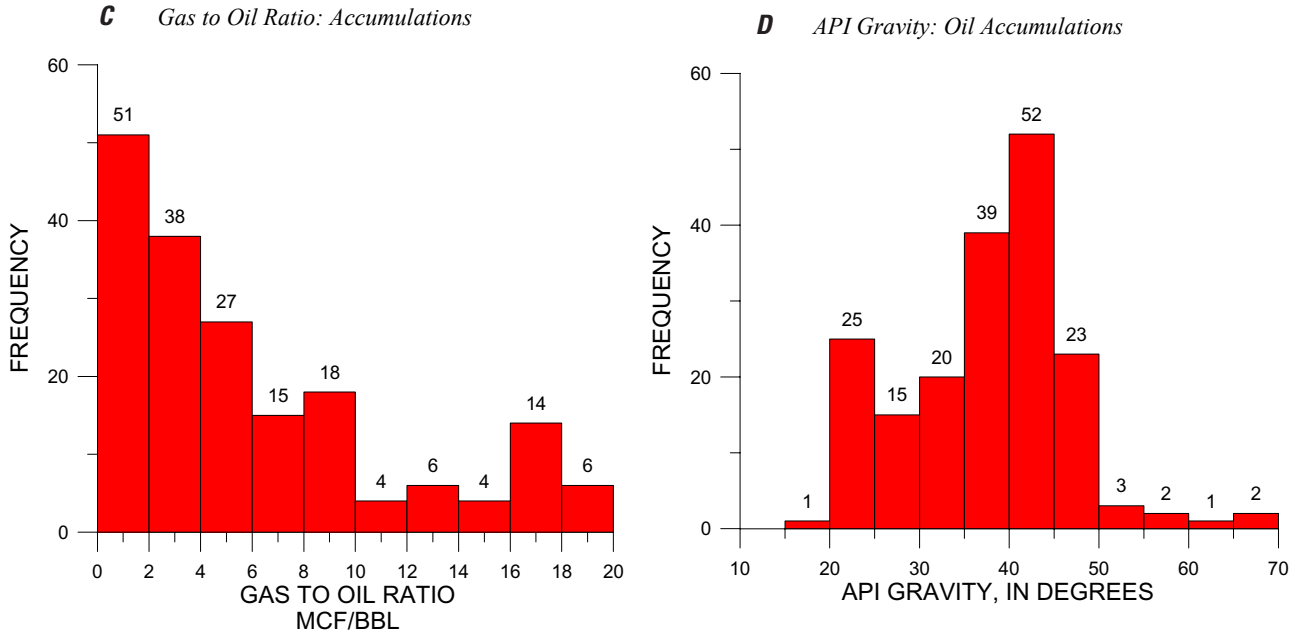

Figure 27. Continued. *C.* Histogram of gas to oil ratios, in thousands of cubic feet per barrel, of discovered oil accumulations . *D.* Histogram of API gravities of discovered oil accumulations.

Table 31. Numbers of discovered oil accumulations and volume of known oil recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Oil Accumulations Number	Oil Accumulations Percent of Play	Oil Volume MMBO	Oil Volume Percent of Play
		By lithology				
4733	sandstone		180	98.4	2,631	100
4733	sandstone	shale	2	1.1	22	0.8
4733	shale		1	0.5	1	0
PLAY TOTAL			183	100	2,654	100
USGS Play Number	Trap type		Number	Percent of Play	MMBO	Percent of Play
		By trap type				
4733	combination		81	44.3	1,879	70.8
4733	stratigraphic		4	2.2	12	0.5
4733	structural		79	43.2	724	27.3
PLAY SUBTOTAL			164	89.7	2,615	98.6

Oil: Play 4735–Frio SE Texas/S. Louisiana Mid-Dip Gas and Oil; Western Gulf

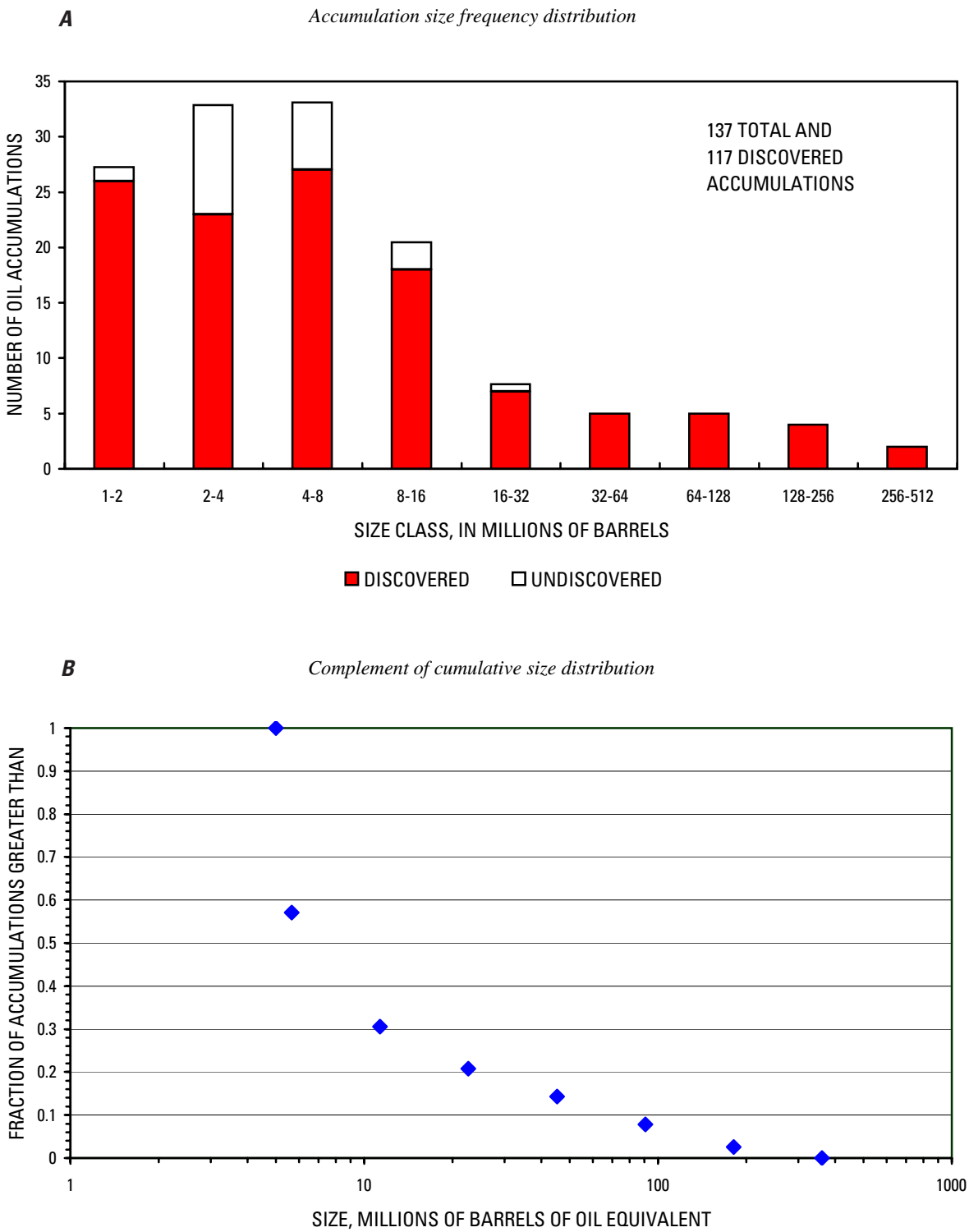

Figure 28. *A*. Size-frequency distribution of discovered and expected undiscovered oil accumulations where the minimum accumulation size is 1 million barrels of oil equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 5 million barrels of oil equivalent.

Oil: Play 4735–Frio SE Texas/S. Louisiana Mid-Dip Gas and Oil; Western Gulf

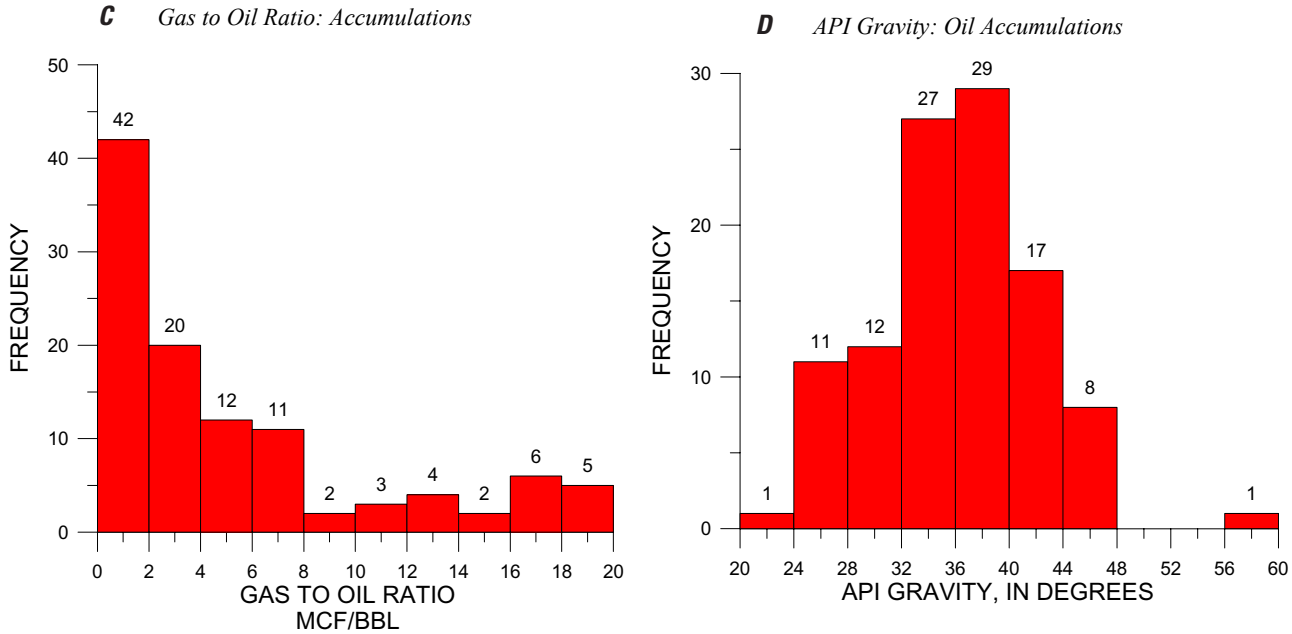

Figure 28. Continued. *C*. Histogram of gas to oil ratios, in thousands of cubic feet per barrel, of discovered oil accumulations . *D*. Histogram of API gravities of discovered oil accumulations.

Table 32. Numbers of discovered oil accumulations and volume of known oil recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Oil Accumulations Number	Oil Accumulations Percent of Play	Oil Volume MMBO	Oil Volume Percent of Play
		By lithology				
4735	sandstone		107	100	1,086	100
PLAY TOTAL			107	100	1,086	100
USGS Play Number	**Trap type**		**Number**	**Percent of Play**	**MMBO**	**Percent of Play**
		By trap type				
4735	combination		45	42.1	874	80.6
4735	structural		43	40.2	179	16.4
PLAY SUBTOTAL			88	82.3	1,053	97

Oil: Play 4912–Smackover Salt Basins Gas and Oil; Louisiana-Mississippi Salt Basins

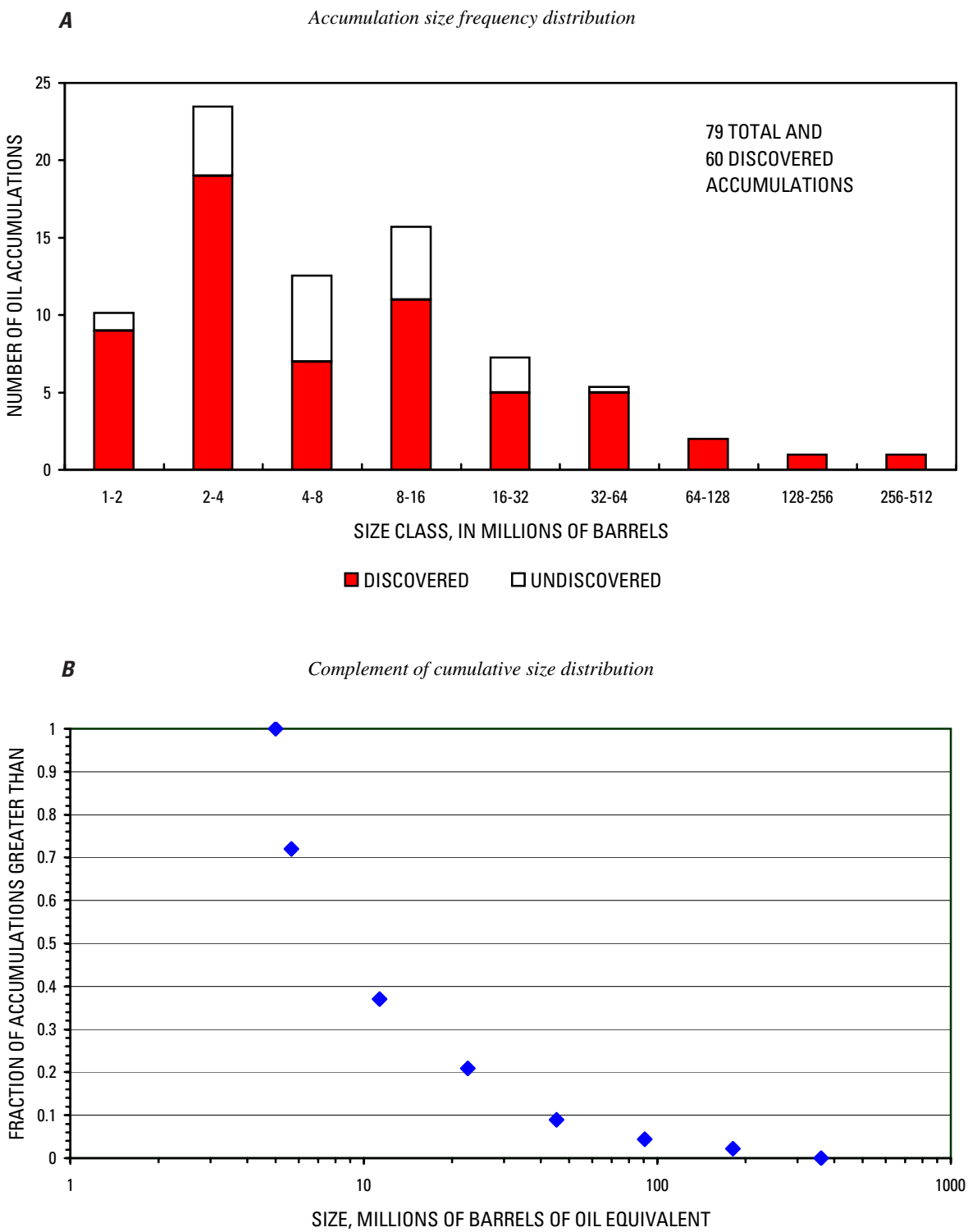

Figure 29. *A*. Size-frequency distribution of discovered and expected undiscovered oil accumulations where the minimum accumulation size is 1 million barrels of oil equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 5 million barrels of oil equivalent.

Oil: Play 4912–Smackover Salt Basins Gas and Oil; Louisiana-Mississippi Salt Basins

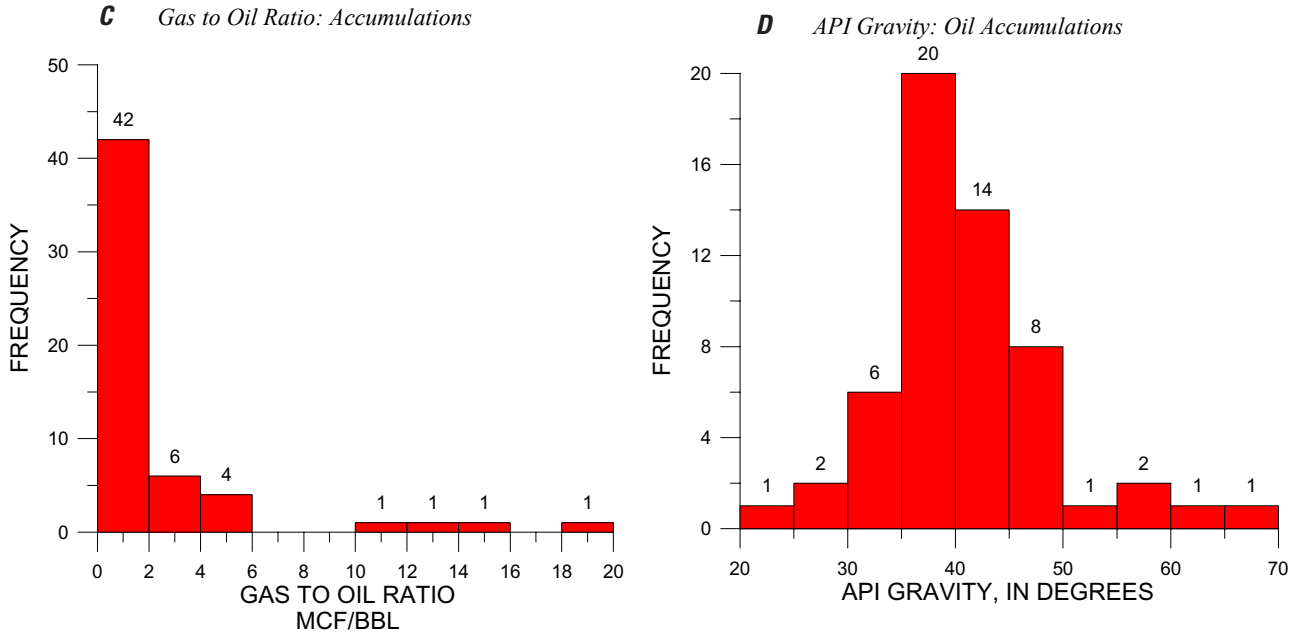

Figure 29. Continued. *C*. Histogram of gas to oil ratios, in thousands of cubic feet per barrel, of discovered oil accumulations . *D*. Histogram of API gravities of discovered oil accumulations.

Table 33. Numbers of discovered oil accumulations and volume of known oil recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Oil Accumulations Number	Oil Accumulations Percent of Play	Oil Volume MMBO	Oil Volume Percent of Play
		By lithology				
4912	dolomite	anhydrite	1	1.8	2	0.3
4912	dolomite	limestone	2	3.6	2	0.4
4912	limestone	dolomite	2	3.6	4	0.7
4912	limestone		50	89.3	552	98.2
4912	limestone	sandstone	1	1.8	2	0.4
PLAY TOTAL			56	100	562	100

USGS Play Number	Trap type	Number	Percent of Play	MMBO	Percent of Play
	By trap type				
4912	combination	19	33.9	318	56.6
4912	stratigraphic	3	5.4	45	8
4912	structural	28	50	175	31.1
PLAY SUBTOTAL		50	89.3	538	95.7

Oil: Play 4932–Glen Rose/Rodessa Updip Oil; Louisiana-Mississippi Salt Basins

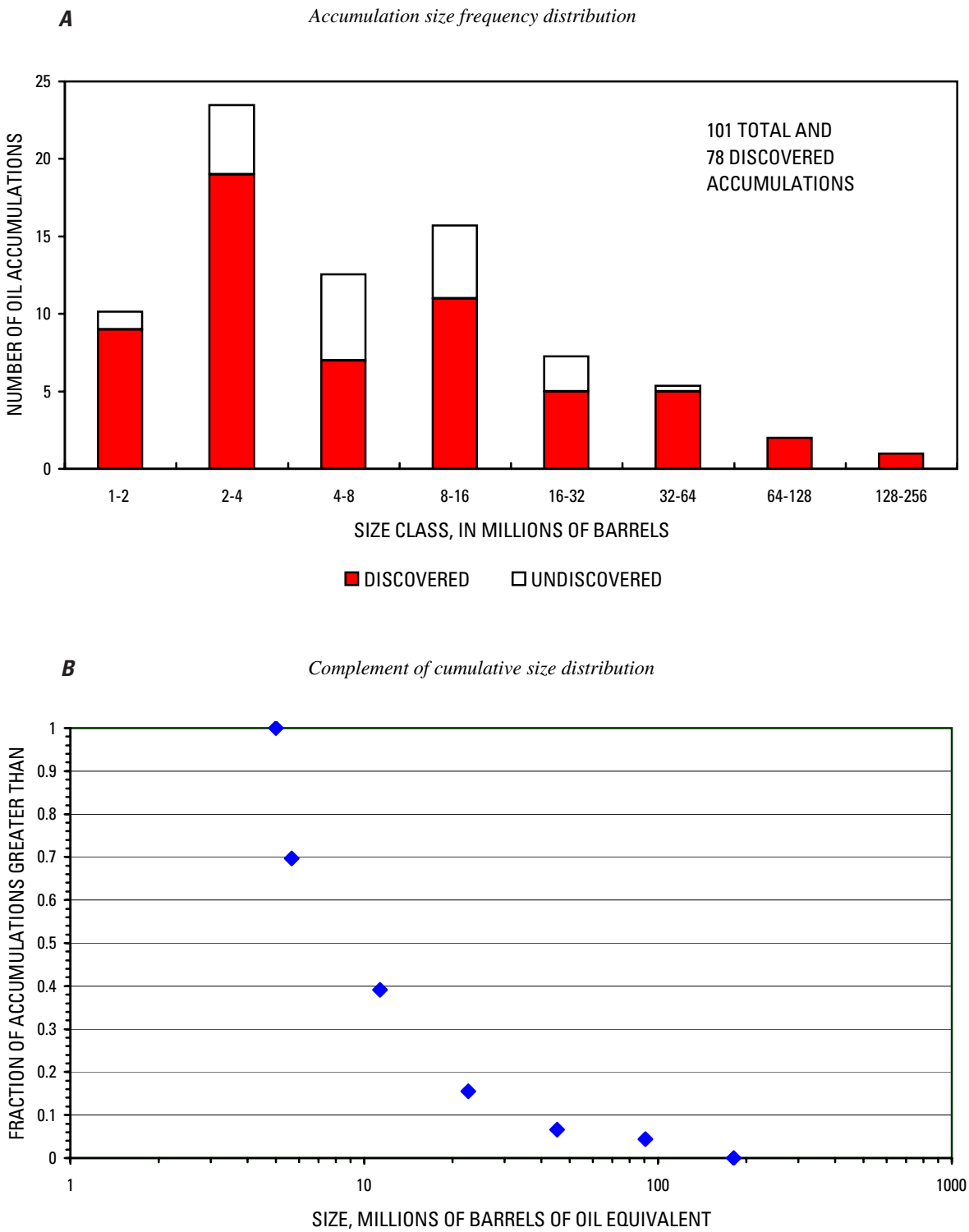

Figure 30. *A*. Size-frequency distribution of discovered and expected undiscovered oil accumulations where the minimum accumulation size is 1 million barrels of oil equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 5 million barrels of oil equivalent.

Oil: Play 4932–Glen Rose/Rodessa Updip Oil; Louisiana-Mississippi Salt Basins

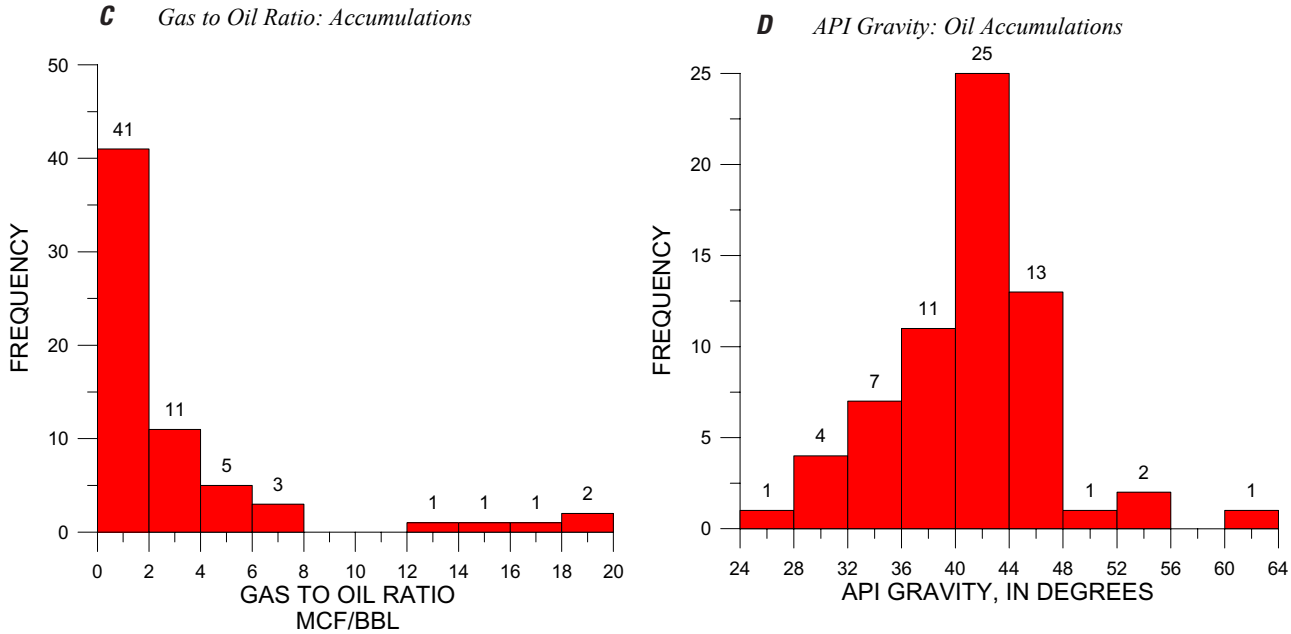

Figure 30. Continued. *C*. Histogram of gas to oil ratios, in thousands of cubic feet per barrel, of discovered oil accumulations . *D*. Histogram of API gravities of discovered oil accumulations.

Table 34. Numbers of discovered oil accumulations and volume of known oil recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Oil Accumulations Number	Oil Accumulations Percent of Play	Oil Volume MMBO	Oil Volume Percent of Play
		By lithology				
4932	anhydrite	sandstone	1	1.5	3	0.5
4932	limestone	dolomite	1	1.5	17	2.7
4932	limestone		19	29.2	89	14.5
4932	limestone	sandstone	8	12.3	57	9.2
4932	sandstone	conglomerate	1	1.5	14	2.2
4932	sandstone	limestone	10	15.4	106	17.3
4932	sandstone		25	38.5	329	53.6
PLAY TOTAL			65	100	613	100

USGS Play Number	Trap type	Number	Percent of Play	MMBO	Percent of Play
	By trap type				
4932	combination	37	56.9	486	79.3
4932	stratigraphic	8	12.3	34	5.6
4932	structural	17	26.2	89	14.5
PLAY SUBTOTAL		62	95.4	609	99.4

Oil: Play 4934–Paluxy Updip Oil; Louisiana-Mississippi Salt Basins

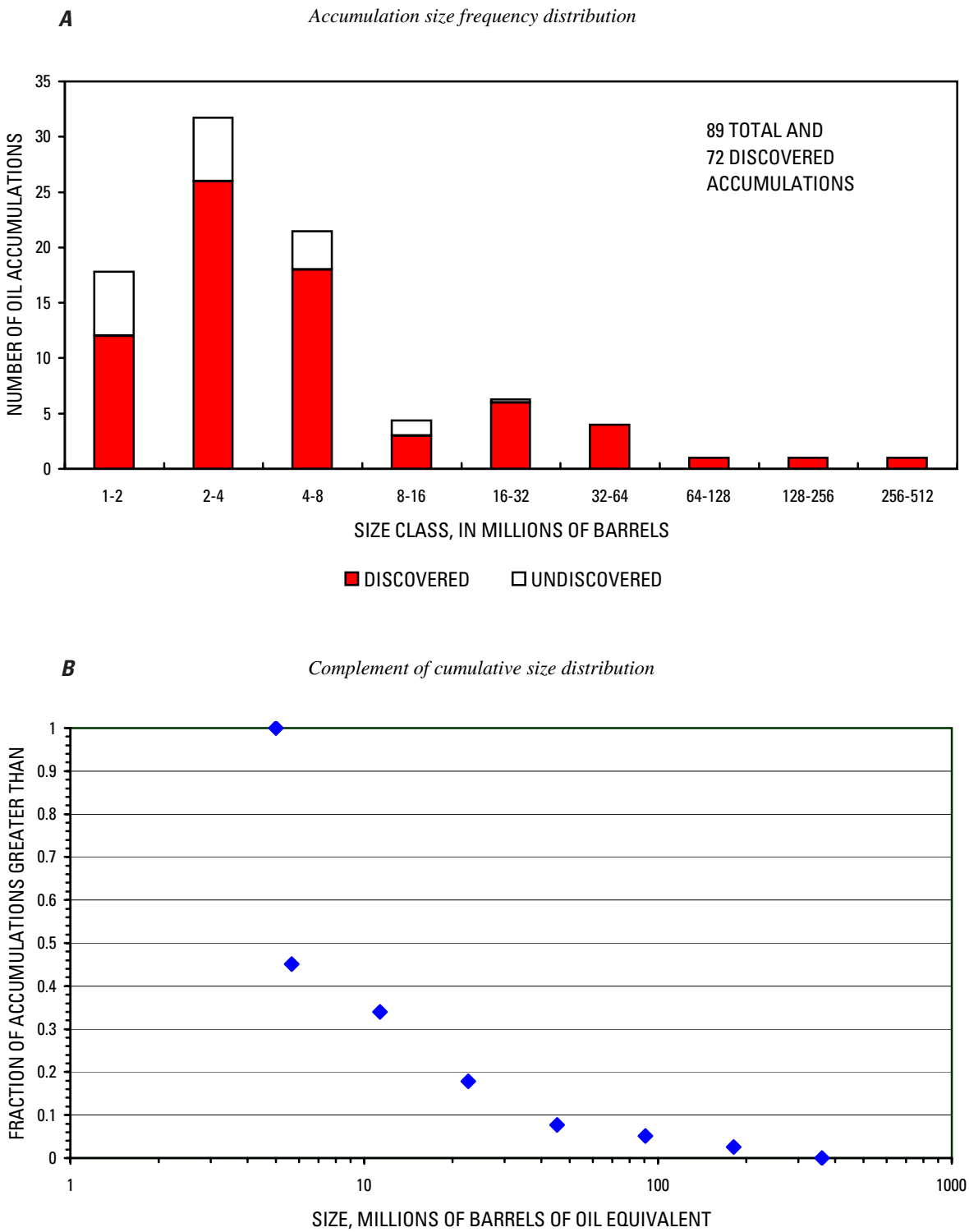

Figure 31. *A*. Size-frequency distribution of discovered and expected undiscovered oil accumulations where the minimum accumulation size is 1 million barrels of oil equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 5 million barrels of oil equivalent.

Oil: Play 4934–Paluxy Updip Oil; Louisiana-Mississippi Salt Basins

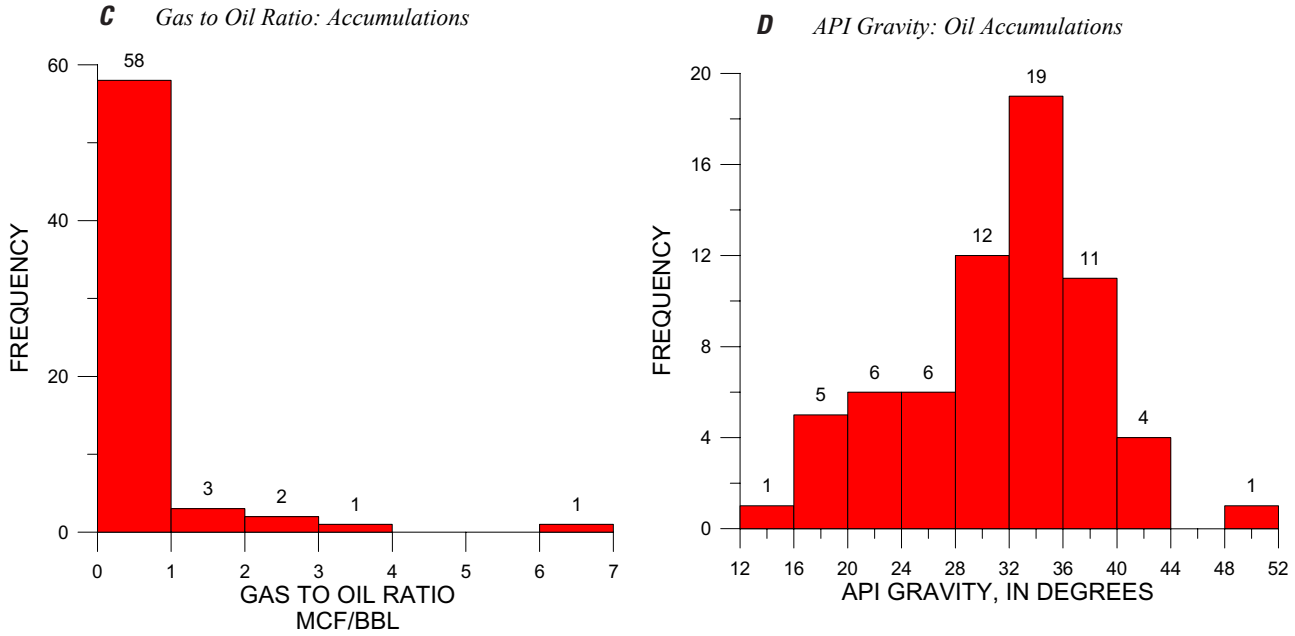

Figure 31. Continued. *C*. Histogram of gas to oil ratios, in thousands of cubic feet per barrel, of discovered oil accumulations . *D*. Histogram of API gravities of discovered oil accumulations.

Table 35. Numbers of discovered oil accumulations and volume of known oil recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Oil Accumulations: Number	Oil Accumulations: Percent of Play	Oil Volume: MMBO	Oil Volume: Percent of Play
		By lithology				
4934	limestone		2	3.1	15	1.8
4934	sandstone		58	89.2	697	85.7
4934	sandstone	shale	5	7.7	102	12.5
PLAY TOTAL			65	100	814	100

USGS Play Number	Trap type	Number	Percent of Play	MMBO	Percent of Play
	By trap type				
4934	combination	27	41.5	691	84.9
4934	stratigraphic	2	3.1	4	0.5
4934	structural	32	49.2	112	13.8
PLAY SUBTOTAL		61	93.8	808	99.2

Oil: Play 4937–Tuscaloosa/Woodbine Structural Oil and Gas; Louisiana-Mississippi Salt Basins

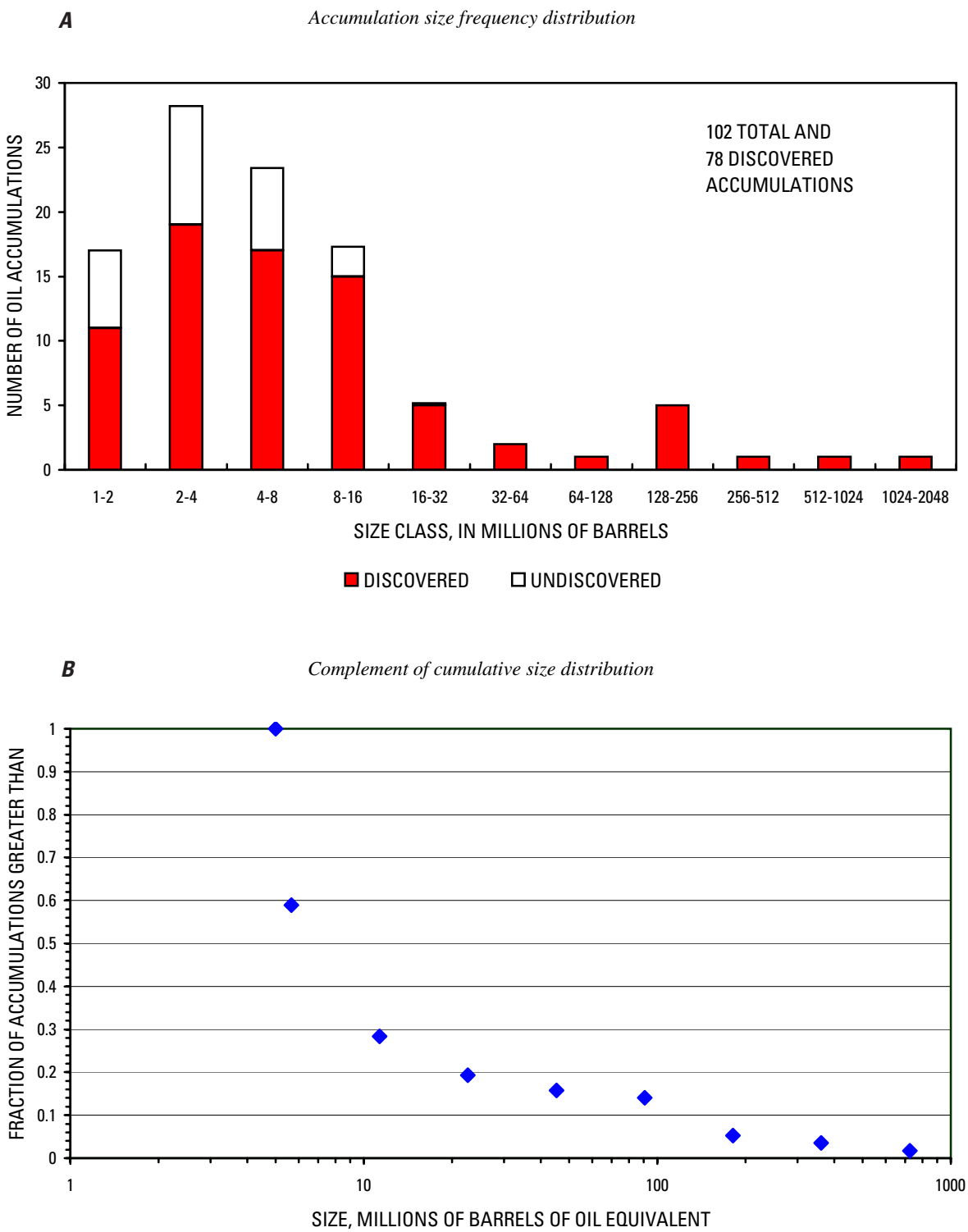

Figure 32. *A*. Size-frequency distribution of discovered and expected undiscovered oil accumulations where the minimum accumulation size is 1 million barrels of oil equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 5 million barrels of oil equivalent.

Oil: Play 4937–Tuscaloosa/Woodbine Structural Oil and Gas; Louisiana-Mississippi Salt Basins

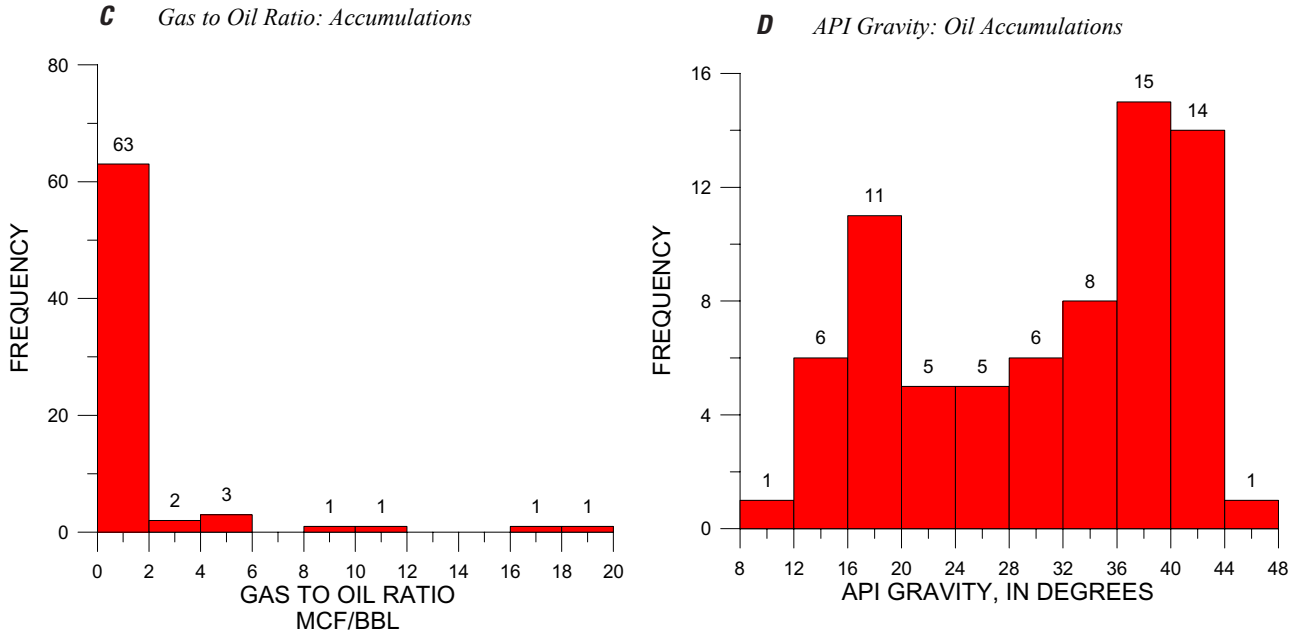

Figure 32. Continued. *C*. Histogram of gas to oil ratios, in thousands of cubic feet per barrel, of discovered oil accumulations . *D*. Histogram of API gravities of discovered oil accumulations.

Table 36. Numbers of discovered oil accumulations and volume of known oil recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Oil Accumulations Number	Oil Accumulations Percent of Play	Oil Volume MMBO	Oil Volume Percent of Play
		By lithology				
4937	sandstone		71	98.6	2,428	99.5
4937	sandstone	shale	1	1.4	12	0.5
PLAY TOTAL			72	100	2,441	100
USGS Play Number	**Trap type**		**Number**	**Percent of Play**	**MMBO**	**Percent of Play**
		By trap type				
4937	combination		37	51.4	1,955	80.1
4937	stratigraphic		6	8.3	25	1
4937	structural		25	34.7	455	18.7
PLAY SUBTOTAL			68	94.4	2,434	99.8

Oil: Play 4945–Wilcox Salt Basins Oil; Louisiana-Mississippi Salt Basins

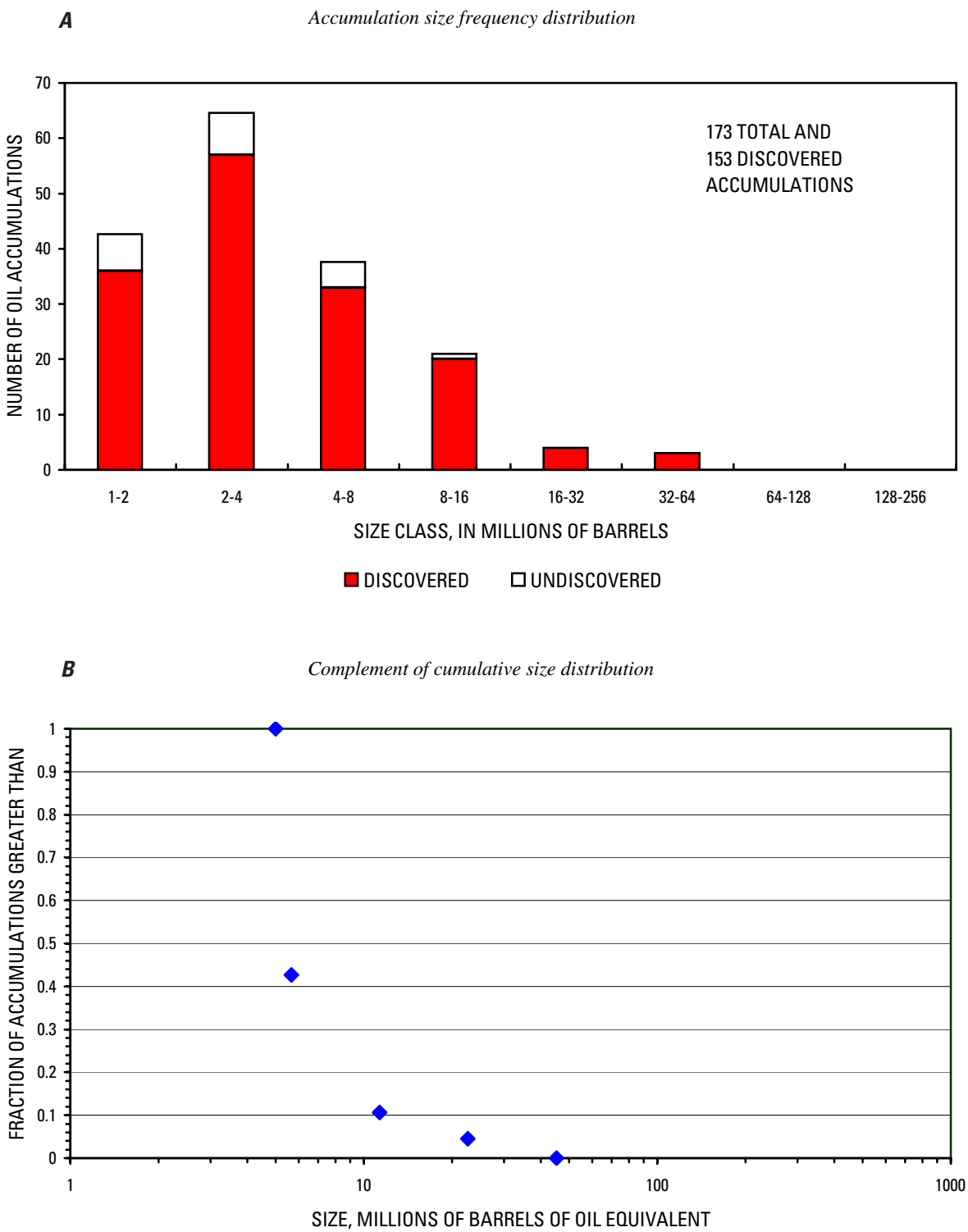

Figure 33. *A*. Size-frequency distribution of discovered and expected undiscovered oil accumulations where the minimum accumulation size is 1 million barrels of oil equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 5 million barrels of oil equivalent.

Oil: Play 4945–Wilcox Salt Basins Oil; Louisiana-Mississippi Salt Basins

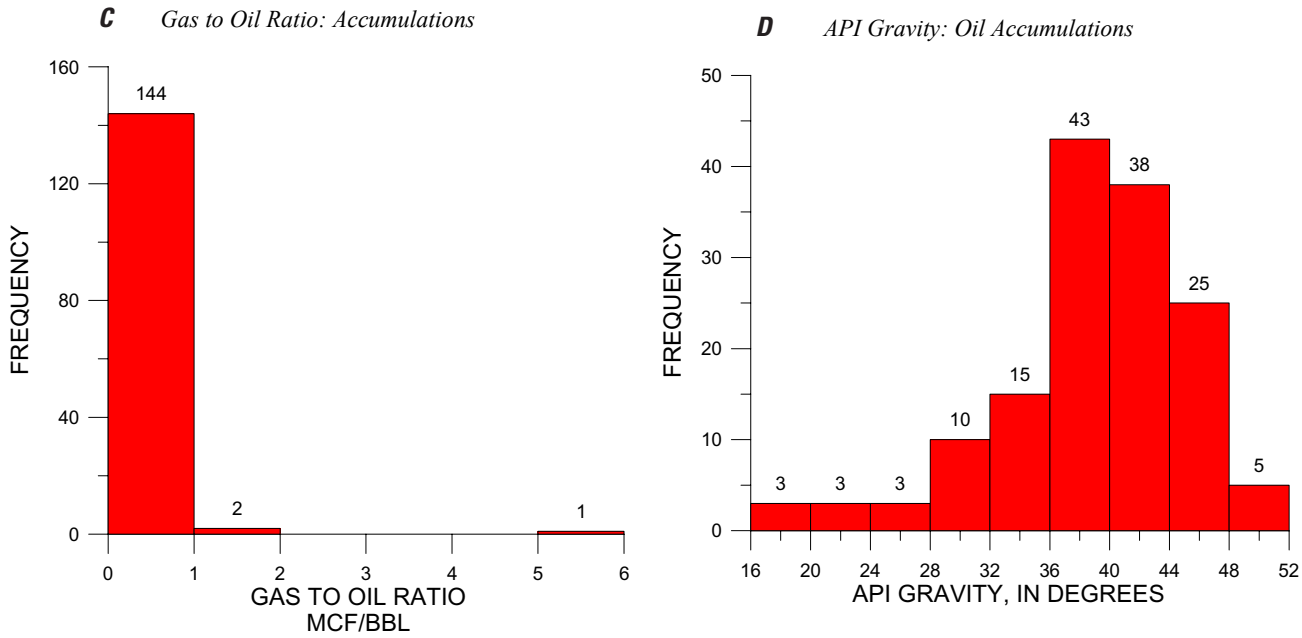

Figure 33. Continued. *C*. Histogram of gas to oil ratios, in thousands of cubic feet per barrel, of discovered oil accumulations . *D*. Histogram of API gravities of discovered oil accumulations.

Table 37. Numbers of discovered oil accumulations and volume of known oil recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Oil Accumulations Number	Oil Accumulations Percent of Play	Oil Volume MMBO	Oil Volume Percent of Play
		By lithology				
4945	sandstone		147	100	546	100
PLAY TOTAL			147	100	546	100
USGS Play Number	**Trap type**		**Number**	**Percent of Play**	**MMBO**	**Percent of Play**
		By trap type				
4945	combination		70	47.6	320	58.7
4945	stratigraphic		15	10.2	57	10.4
4945	structural		48	32.7	142	26
PLAY SUBTOTAL			133	90.5	519	95.1

Oil: Play 5305–Pennsylvanian Cyclical Carbonates and Sandstones; Cambridge Arch-Central Kansas

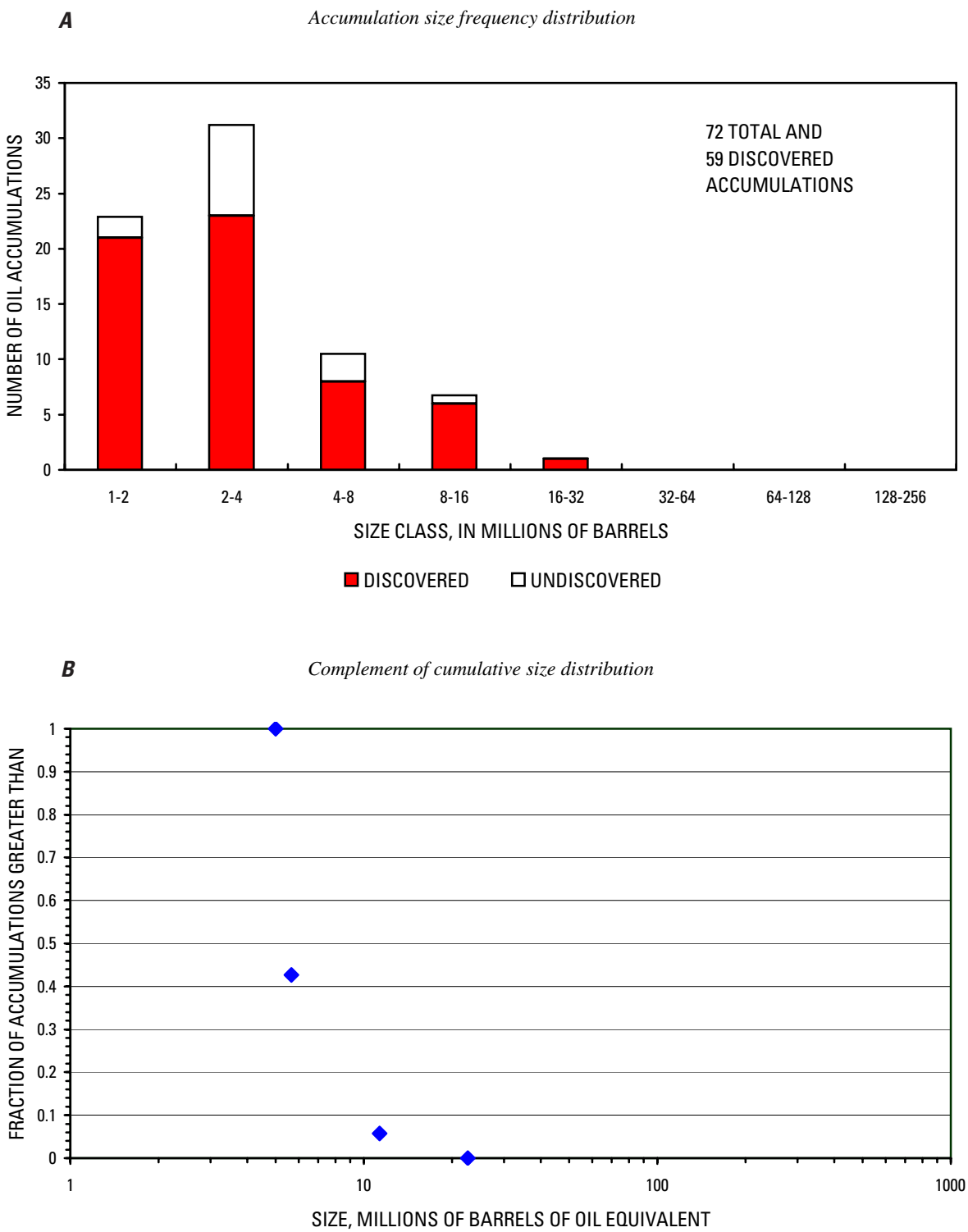

Figure 34. *A*. Size-frequency distribution of discovered and expected undiscovered oil accumulations where the minimum accumulation size is 1 million barrels of oil equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 5 million barrels of oil equivalent.

Oil: Play 5305–Pennsylvanian Cyclical Carbonates and Sandstones; Cambridge Arch-Central Kansas

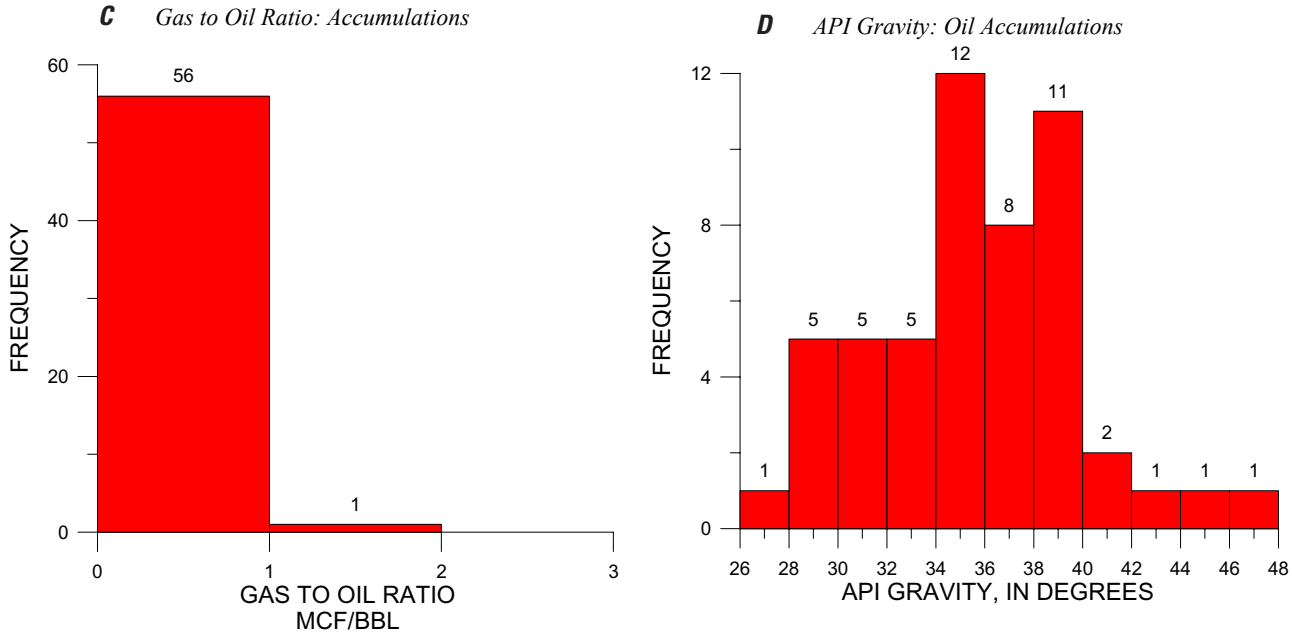

Figure 34. Continued. *C*. Histogram of gas to oil ratios, in thousands of cubic feet per barrel, of discovered oil accumulations . *D*. Histogram of API gravities of discovered oil accumulations.

Table 38. Numbers of discovered oil accumulations and volume of known oil recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Oil Accumulations Number	Oil Accumulations Percent of Play	Oil Volume MMBO	Oil Volume Percent of Play
		By lithology				
5305	conglomerate		2	3.5	3	1.7
5305	limestone		49	86	144	91.8
5305	sandstone	conglomerate	1	1.8	1	0.7
5305	sandstone		5	8.8	9	5.9
PLAY TOTAL			57	100	157	100
USGS Play Number	**Trap type**		**Number**	**Percent of Play**	**MMBO**	**Percent of Play**
		By trap type				
5305	combination		14	24.6	53	33.5
5305	stratigraphic		1	1.8	1	0.8
5305	structural		12	21.1	33	21.2
PLAY SUBTOTAL			27	47.5	87	55.5

Oil: Play 5816–Morrow Sandstone Gas and Oil Stratigraphic; Anadarko Basin

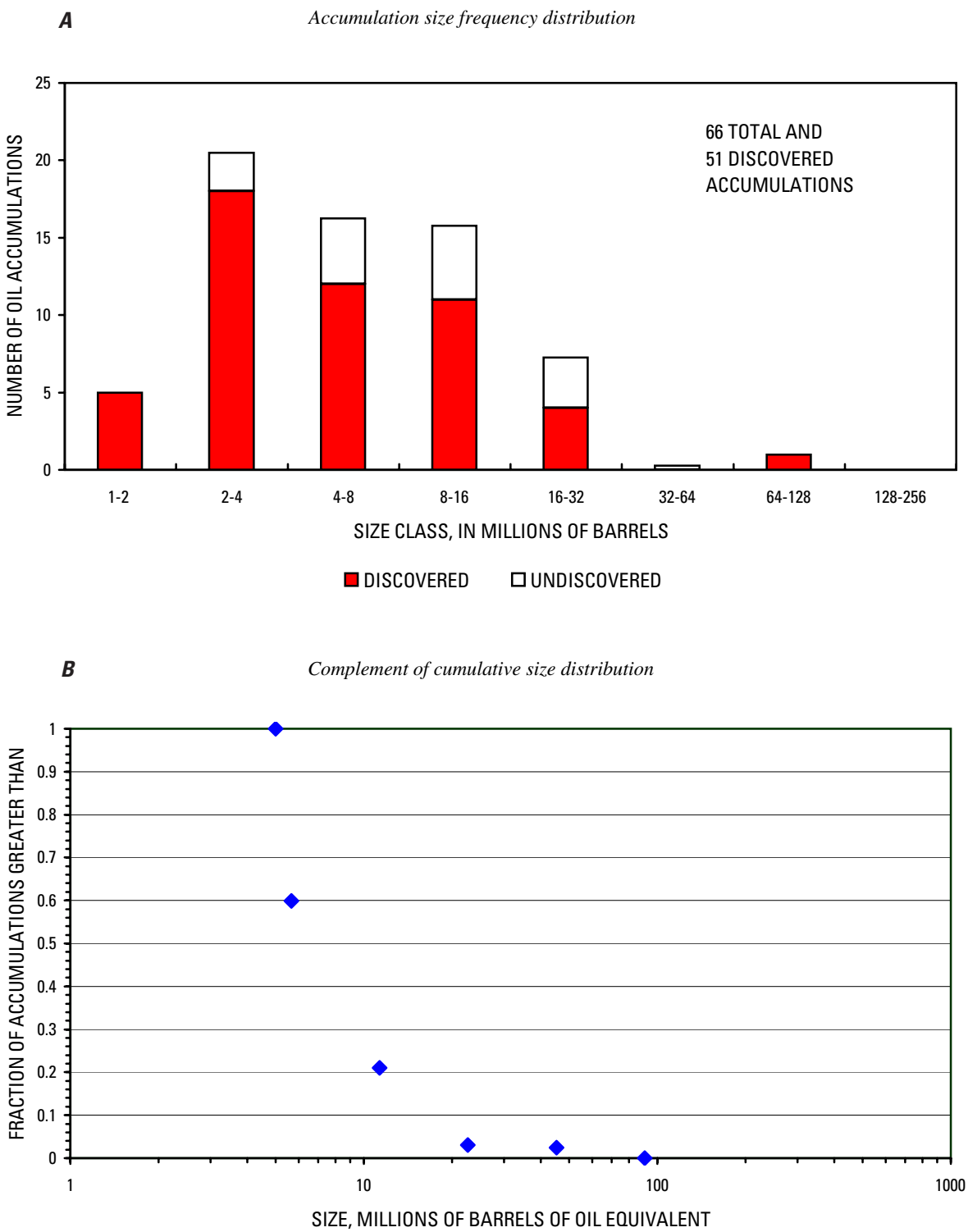

Figure 35. *A*. Size-frequency distribution of discovered and expected undiscovered oil accumulations where the minimum accumulation size is 1 million barrels of oil equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 5 million barrels of oil equivalent.

Oil: Play 5816–Morrow Sandstone Gas and Oil Stratigraphic; Anadarko Basin

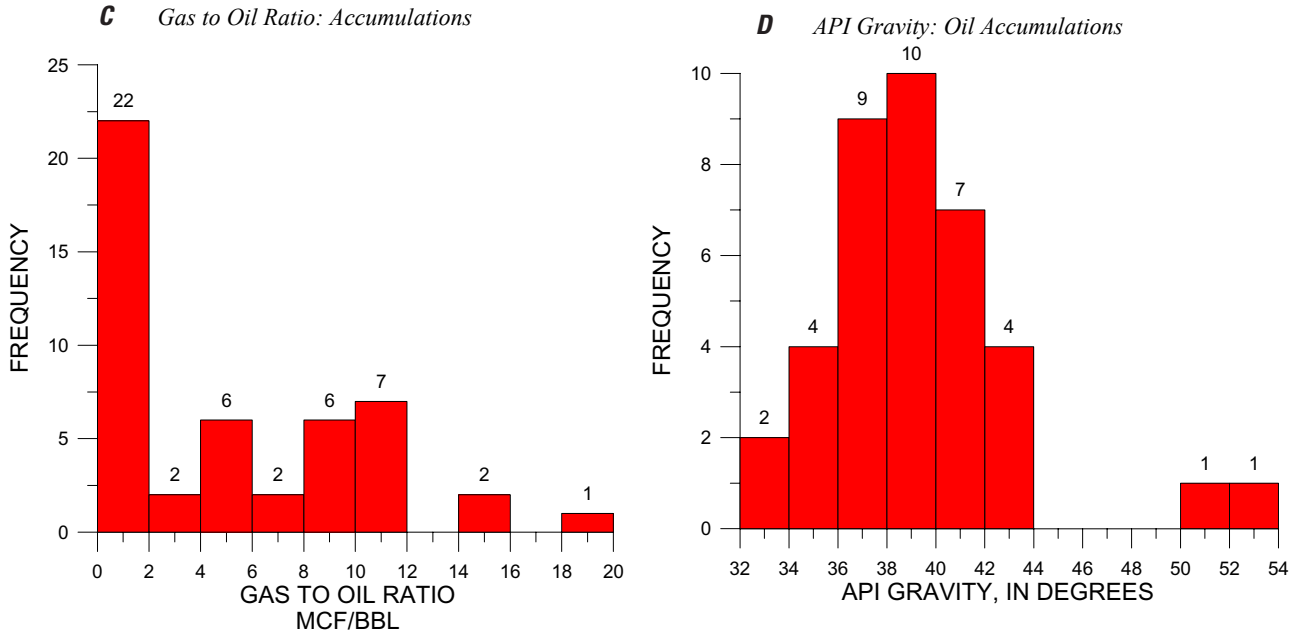

Figure 35. Continued. *C*. Histogram of gas to oil ratios, in thousands of cubic feet per barrel, of discovered oil accumulations . *D*. Histogram of API gravities of discovered oil accumulations.

Table 39. Numbers of discovered oil accumulations and volume of known oil recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Oil Accumulations Number	Oil Accumulations Percent of Play	Oil Volume MMBO	Oil Volume Percent of Play
		By lithology				
5816	sandstone		48	100	170	100
PLAY TOTAL			48	100	170	100
USGS Play Number	**Trap type**		**Number**	**Percent of Play**	**MMBO**	**Percent of Play**
		By trap type				
5816	combination		9	18.8	74	43.5
5816	stratigraphic		17	35.4	45	26.6
5816	structural		2	4.2	14	8.4
PLAY SUBTOTAL			28	58.4	133	78.5

Oil: Play 6005–Pennsylvanian Stratigraphic; Cherokee Basin

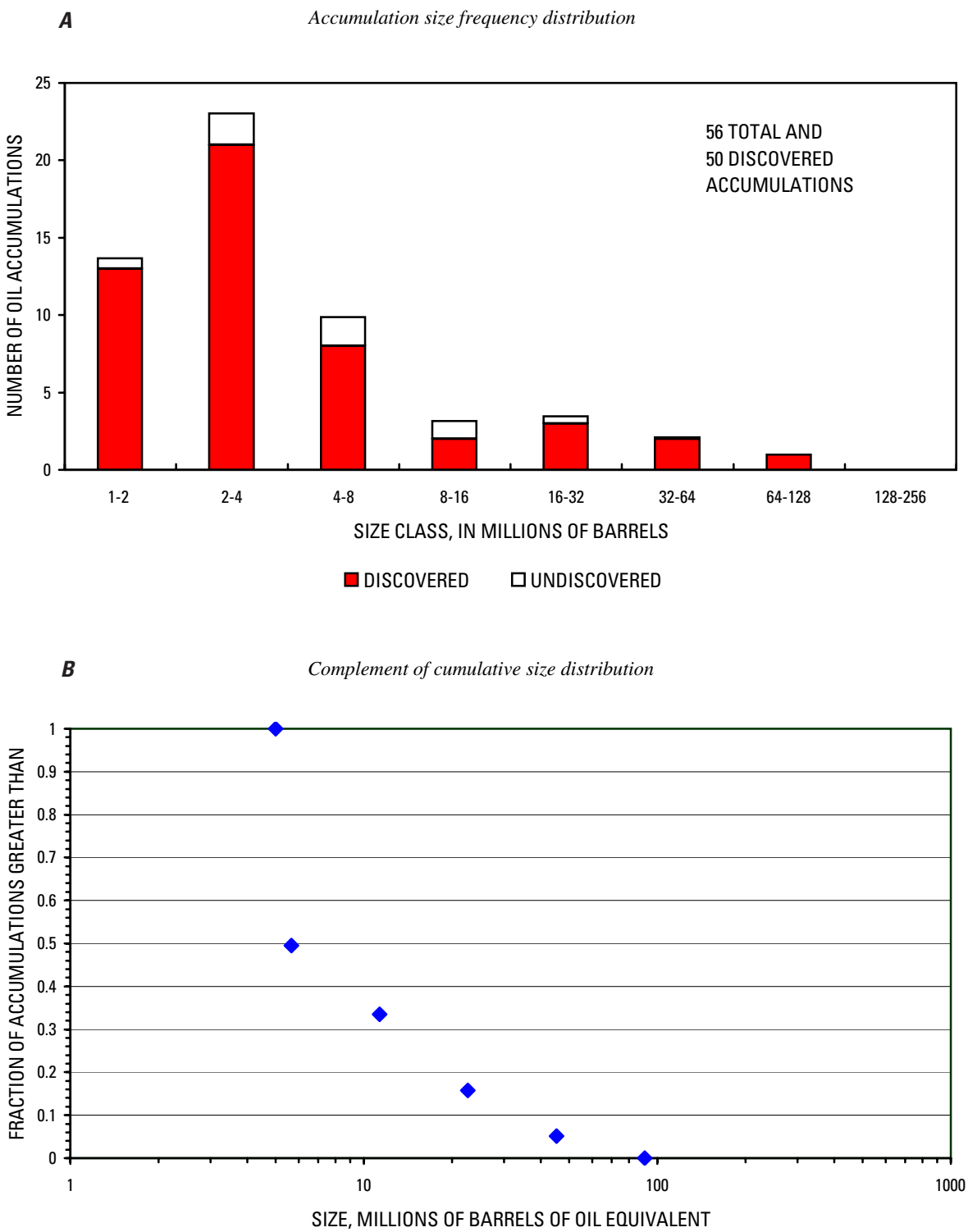

Figure 36. *A*. Size-frequency distribution of discovered and expected undiscovered oil accumulations where the minimum accumulation size is 1 million barrels of oil equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 5 million barrels of oil equivalent.

Oil: Play 6005–Pennsylvanian Stratigraphic; Cherokee Basin

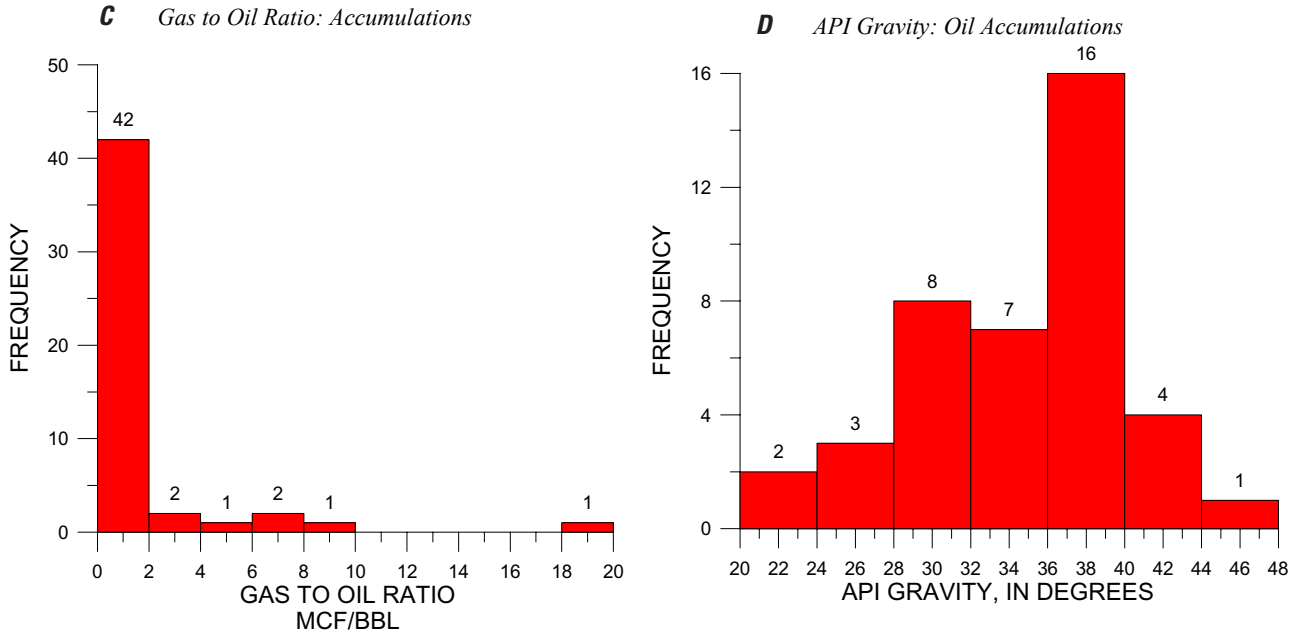

Figure 36. Continued. *C*. Histogram of gas to oil ratios, in thousands of cubic feet per barrel, of discovered oil accumulations . *D*. Histogram of API gravities of discovered oil accumulations.

Table 40. Numbers of discovered oil accumulations and volume of known oil recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Oil Accumulations Number	Oil Accumulations Percent of Play	Oil Volume MMBO	Oil Volume Percent of Play
		By lithology				
6005	sandstone		49	100	257	100
PLAY TOTAL			49	100	257	100
USGS Play Number	**Trap type**		**Number**	**Percent of Play**	**MMBO**	**Percent of Play**
		By trap type				
6005	combination		1	2	1	0.3
6005	stratigraphic		31	63.3	208	80.9
PLAY SUBTOTAL			32	65.3	209	81.2

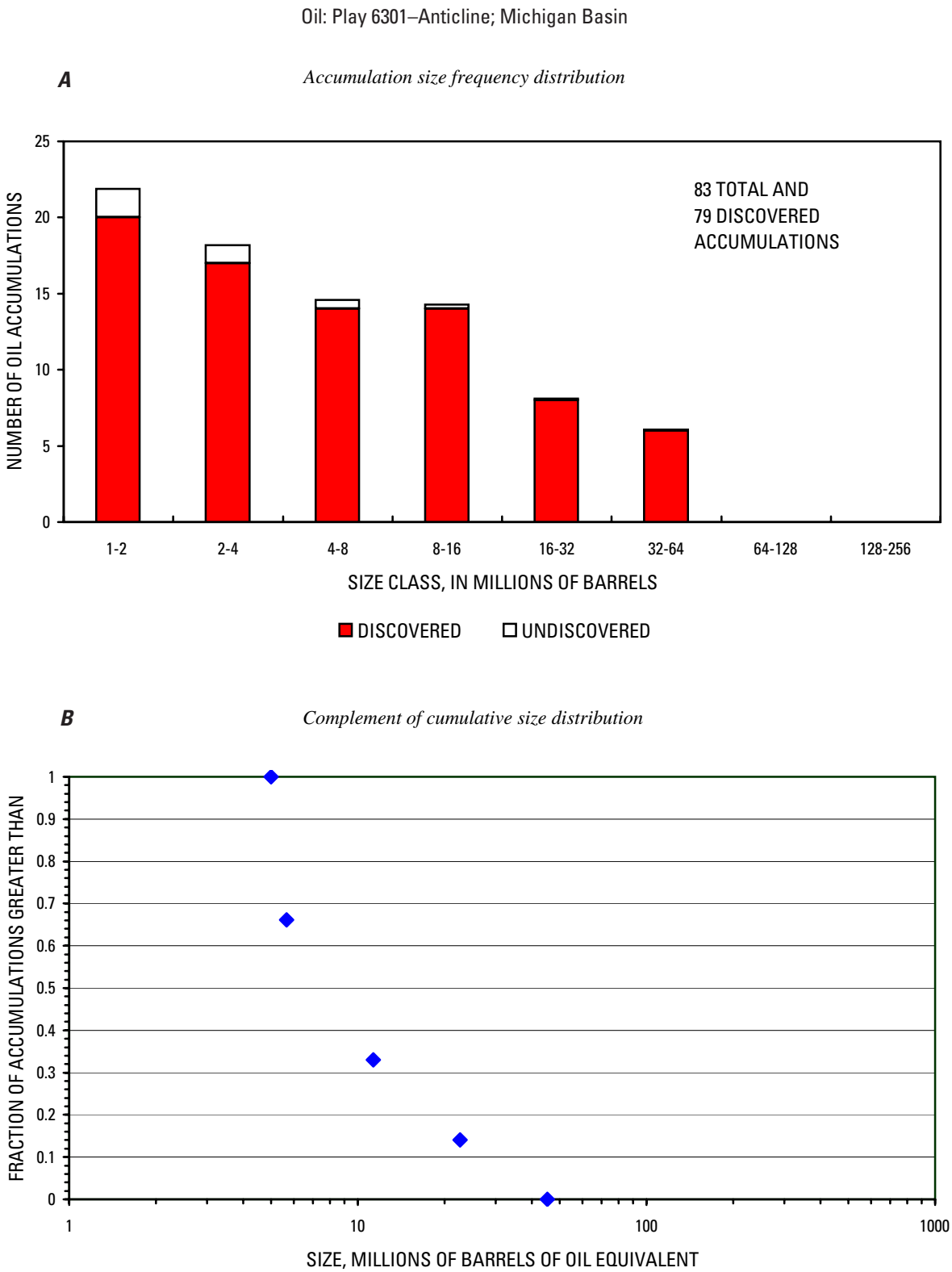

Figure 37. *A*. Size-frequency distribution of discovered and expected undiscovered oil accumulations where the minimum accumulation size is 1 million barrels of oil equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 5 million barrels of oil equivalent.

Oil: Play 6301–Anticline; Michigan Basin

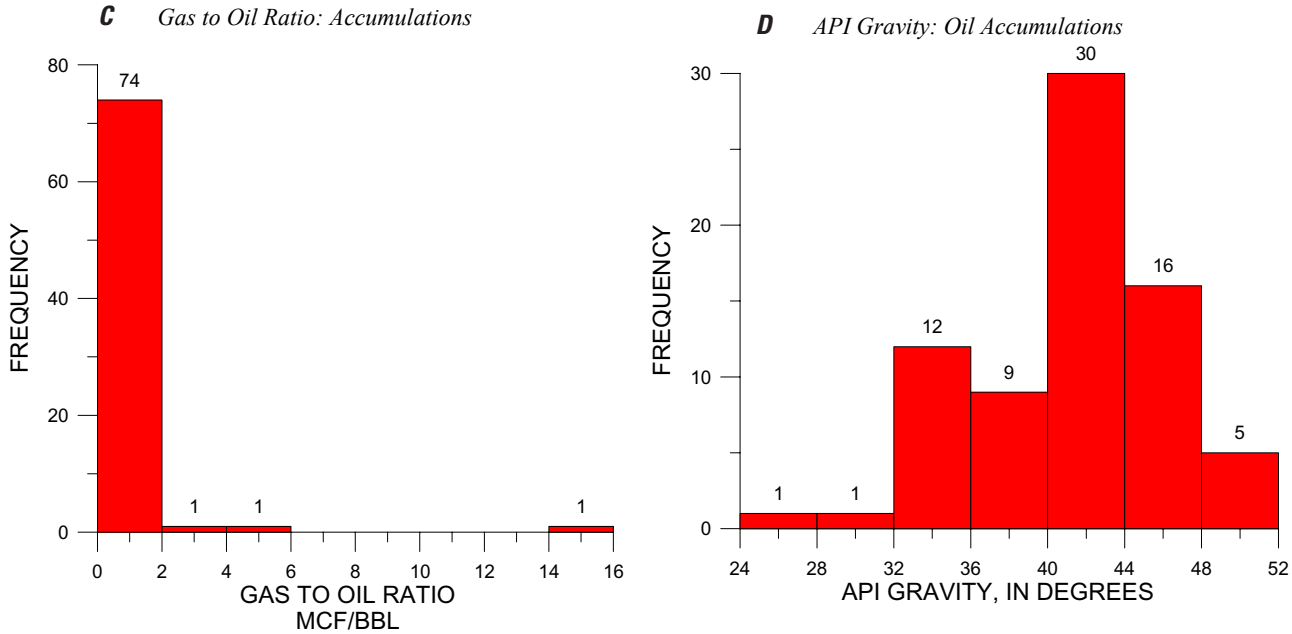

Figure 37. Continued. *C*. Histogram of gas to oil ratios, in thousands of cubic feet per barrel, of discovered oil accumulations . *D*. Histogram of API gravities of discovered oil accumulations.

Table 41. Numbers of discovered oil accumulations and volume of known oil recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Oil Accumulations Number	Oil Accumulations Percent of Play	Oil Volume MMBO	Oil Volume Percent of Play
		By lithology				
6301	dolomite	limestone	7	9.1	69	12.4
6301	dolomite		32	41.6	190	34.2
6301	limestone	dolomite	2	2.6	6	1.1
6301	limestone		36	46.8	291	52.4
PLAY TOTAL			77	100	556	100
USGS Play Number	**Trap type**		**Number**	**Percent of Play**	**MMBO**	**Percent of Play**
		By trap type				
6301	combination		8	10.4	75	13.5
6301	stratigraphic		1	1.3	2	0.4
6301	structural		44	57.1	398	71.6
PLAY SUBTOTAL			53	68.8	476	85.5

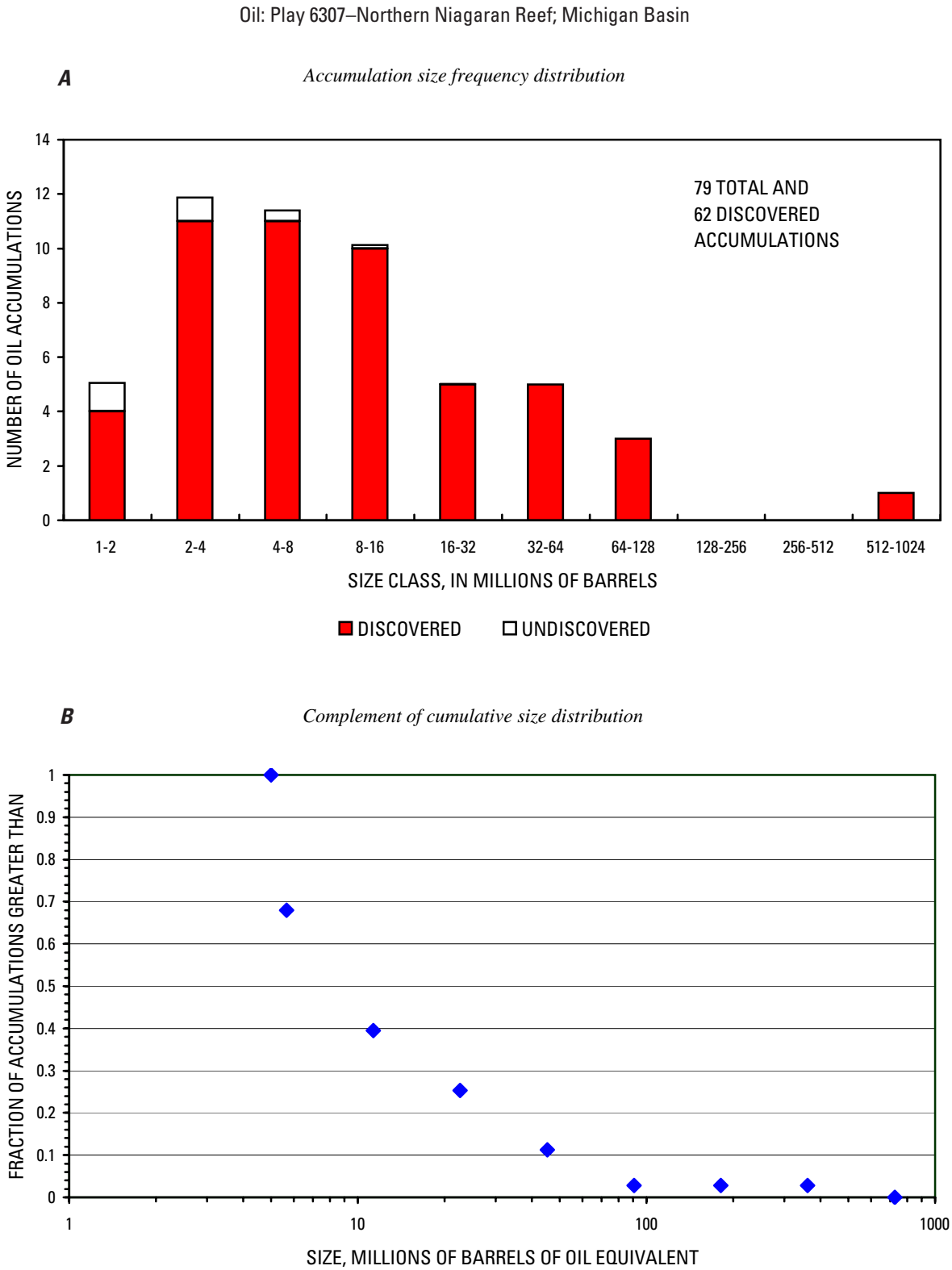

Figure 38. *A*. Size-frequency distribution of discovered and expected undiscovered oil accumulations where the minimum accumulation size is 1 million barrels of oil equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 5 million barrels of oil equivalent.

Oil: Play 6307–Northern Niagaran Reef; Michigan Basin

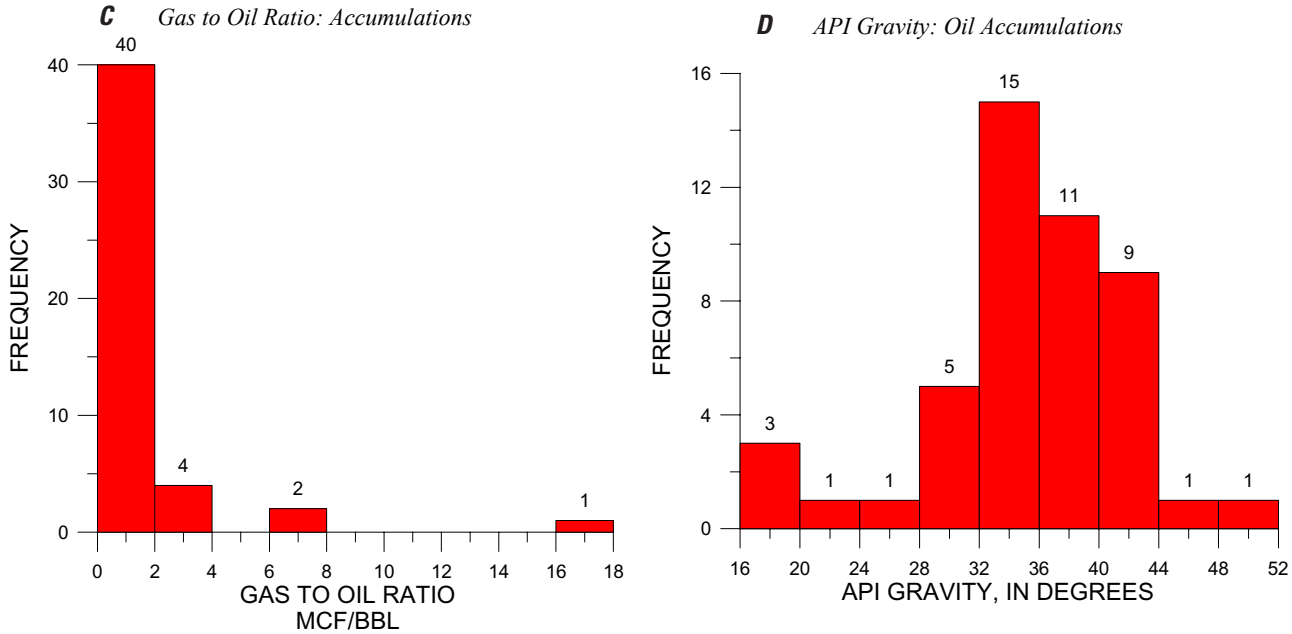

Figure 38. Continued. *C*. Histogram of gas to oil ratios, in thousands of cubic feet per barrel, of discovered oil accumulations . *D*. Histogram of API gravities of discovered oil accumulations.

Table 42. Numbers of discovered oil accumulations and volume of known oil recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Oil Accumulations Number	Oil Accumulations Percent of Play	Oil Volume MMBO	Oil Volume Percent of Play
		By lithology				
3302	dolomite		1	2.1	2	0.1
3302	limestone	dolomite	1	2.1	2	0.2
3302	sandstone	dolomite	2	4.3	70	6.1
3302	sandstone		42	89.4	1,077	93
3302	shale		1	2.1	7	0.6
PLAY TOTAL			47	100	1,158	100

USGS Play Number	Trap type	Number	Percent of Play	MMBO	Percent of Play
	By trap type				
3302	combination	31	66	984	85
3302	stratigraphic	3	6.4	6	0.5
3302	structural	13	27.7	168	14.5
PLAY TOTAL		47	100	1,158	100

Gas: Play 903–Western Winters through Domingene; Sacramento Basin

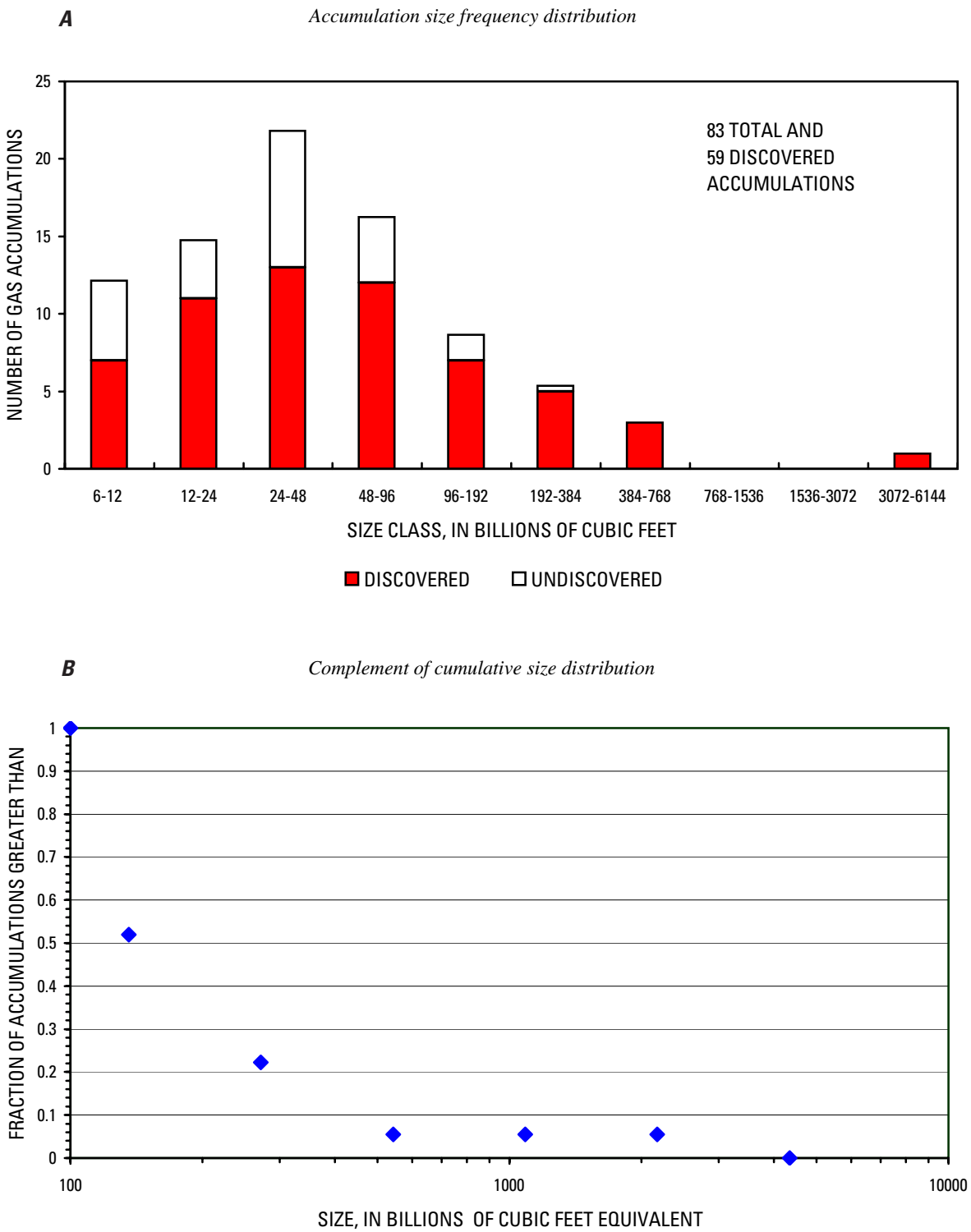

Figure 39. *A*. Size-frequency distribution of discovered and expected undiscovered gas accumulations where the minimum accumulation size is 6 billion cubic feet of gas equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 100 billion cubic feet of gas equivalent.

Gas: Play 903–Western Winters through Domingene; Sacramento Basin

C *Liquids to Gas Ratio: Accumulations*

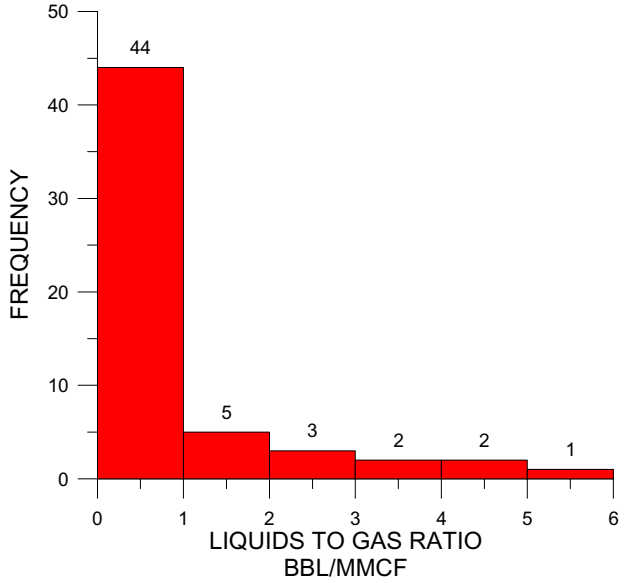

Figure 39. Continued. *C*. Histogram of liquids to gas ratios, in barrels per million cubic feet, of discovered gas accumulations.

Table 43. Numbers of discovered gas accumulations and volume of known gas recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Gas Accumulations Number	Gas Accumulations Percent of Play	Gas Volume BCF	Gas Volume Percent of Play
		By lithology				
903	sandstone		56	98.2	7,102	99.6
903	sandstone	shale	1	1.8	30	0.4
PLAY TOTAL			57	100	7,132	100
USGS Play Number	**Trap type**		**Number**	**Percent of Play**	**BCF**	**Percent of Play**
		By trap type				
903	combination		27	47.4	5,692	79.8
903	stratigraphic		4	7	132	1.8
903	structural		22	38.6	1,254	17.6
PLAY SUBTOTAL			53	93	7,077	99.2

Gas: Play 4401–"Pre-Pennsylvanian, Delaware - Val Verde Basins;" Permian Basin

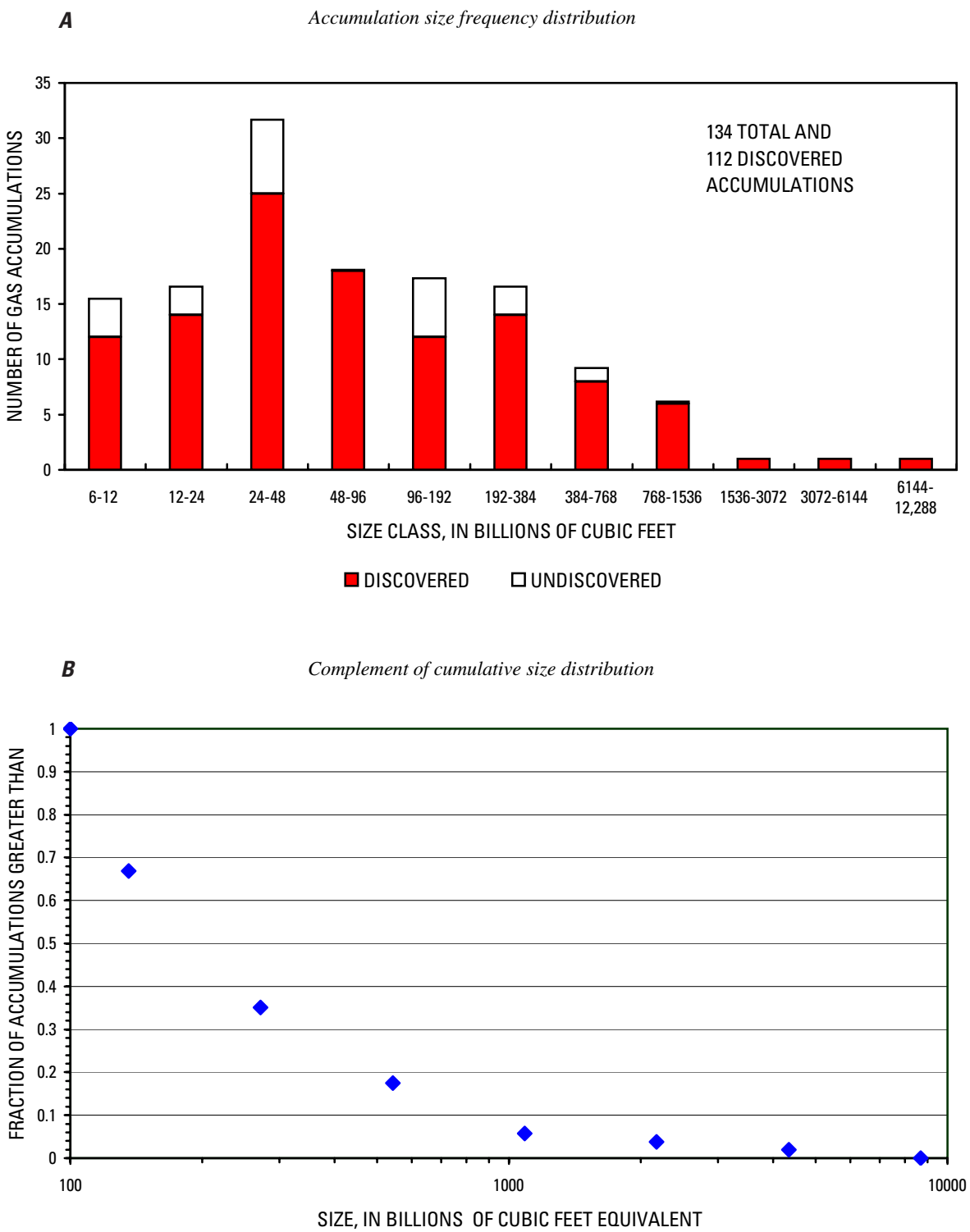

Figure 40. *A*. Size-frequency distribution of discovered and expected undiscovered gas accumulations where the minimum accumulation size is 6 billion cubic feet of gas oil equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 100 billion cubic feet of gas equivalent.

Gas: Play 4401–"Pre-Pennsylvanian, Delaware - Val Verde Basins;" Permian Basin

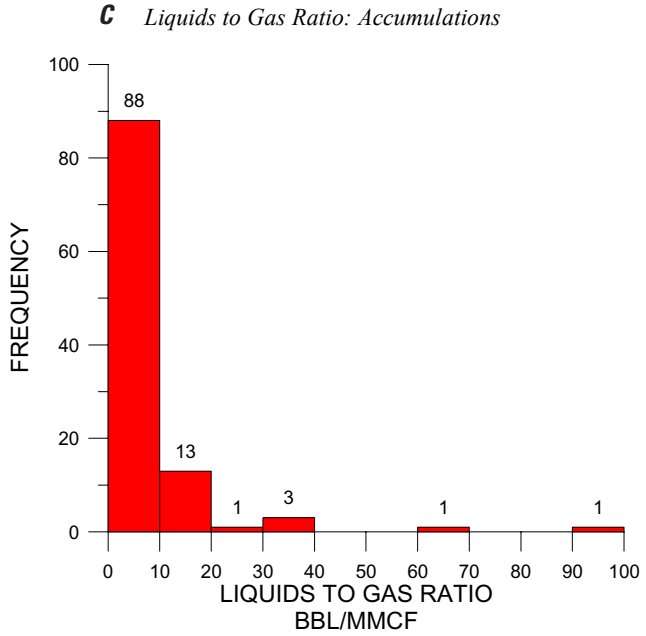

Figure 40. Continued. *C*. Histogram of liquids to gas ratios, in barrels per million cubic feet, of discovered gas accumulations.

Table 44. Numbers of discovered gas accumulations and volume of known gas recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Gas Accumulations Number	Gas Accumulations Percent of Play	Gas Volume BCF	Gas Volume Percent of Play
		By lithology				
4401	chert	dolomite	2	1.9	709	3.1
4401	chert	limestone	6	5.6	448	1.9
4401	chert		4	3.7	435	1.9
4401	dolomite	chert	6	5.6	1,390	6
4401	dolomite	limestone	12	11.2	1,937	8.4
4401	dolomite		58	54.2	16,487	71.6
4401	limestone	chert	3	2.8	213	0.9
4401	limestone	dolomite	6	5.6	865	3.8
4401	limestone		10	9.3	553	2.4
PLAY TOTAL			107	100	23,036	100
USGS Play Number	**Trap type**		**Number**	**Percent of Play**	**BCF**	**Percent of Play**
		By trap type				
4401	combination		7	6.5	539	2.3
4401	structural		82	76.6	22,055	95.7
PLAY SUBTOTAL			89	83.1	22,594	98

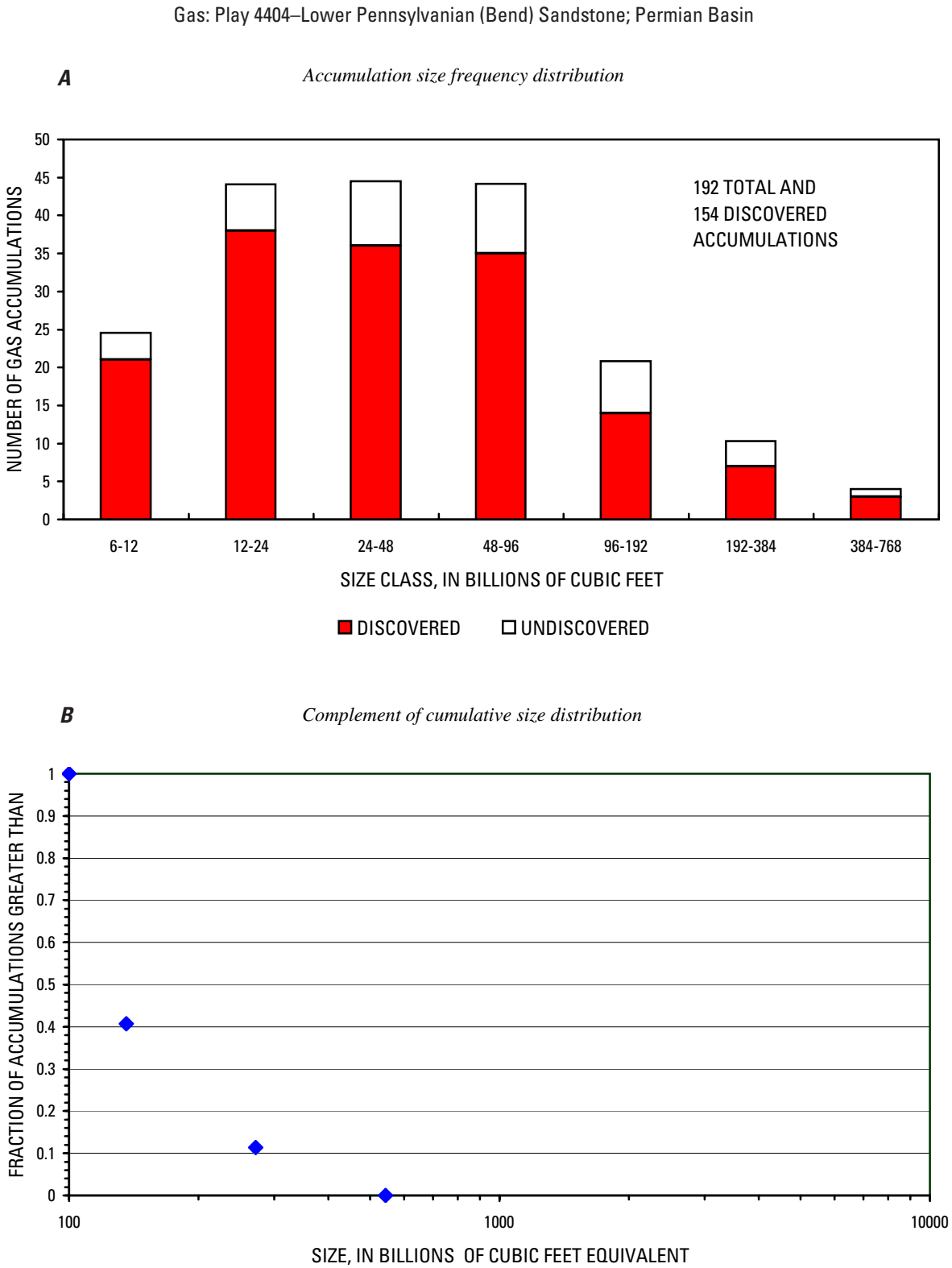

Figure 41. *A*. Size-frequency distribution of discovered and expected undiscovered gas accumulations where the minimum accumulation size is 6 billion cubic feet of gas equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 100 billion cubic feet of gas equivalent.

Gas: Play 4404–Lower Pennsylvanian (Bend) Sandstone; Permian Basin

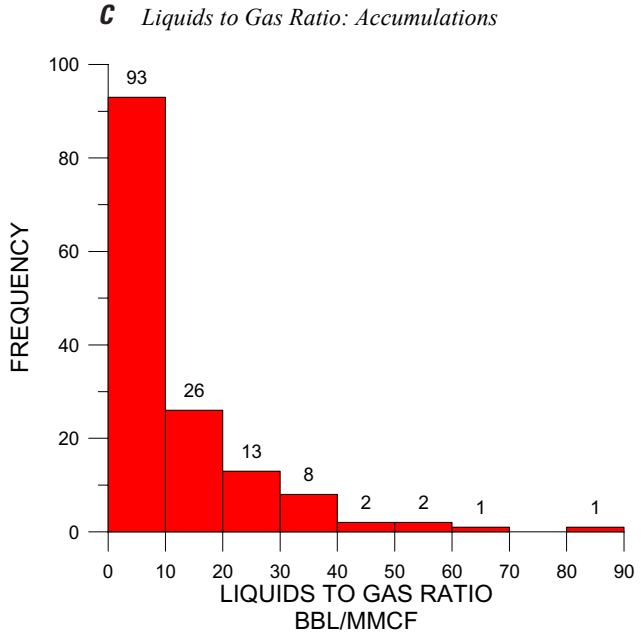

Figure 41. Continued. *C*. Histogram of liquids to gas ratios, in barrels per million cubic feet, of discovered gas accumulations.

Table 45. Numbers of discovered gas accumulations and volume of known gas recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Gas Accumulations Number	Gas Accumulations Percent of Play	Gas Volume BCF	Gas Volume Percent of Play
		By lithology				
4404	limestone	chert	1	0.7	56	0.9
4404	limestone		19	13	611	9.5
4404	limestone	shale	1	0.7	45	0.7
4404	sandstone	dolomite	3	2.1	265	4.1
4404	sandstone	limestone	2	1.4	21	0.3
4404	sandstone		119	81.5	5,382	84.1
4404	sandstone	shale	1	0.7	22	0.3
PLAY TOTAL			146	100	6,402	100
USGS Play Number	**Trap type**		**Number**	**Percent of Play**	**BCF**	**Percent of Play**
		By trap type				
4404	combination		44	30.1	2,960	46.2
4404	stratigraphic		43	29.5	2,076	32.4
4404	structural		5	3.4	73	1.1
PLAY SUBTOTAL			92	63	5,108	79.7

Gas: Play 4406–"Upper Pennsylvanian, Northwestern and Eastern Shelves, Northern Delaware and Midland Basins and Northern Central Basin Platform;" Permian Basin

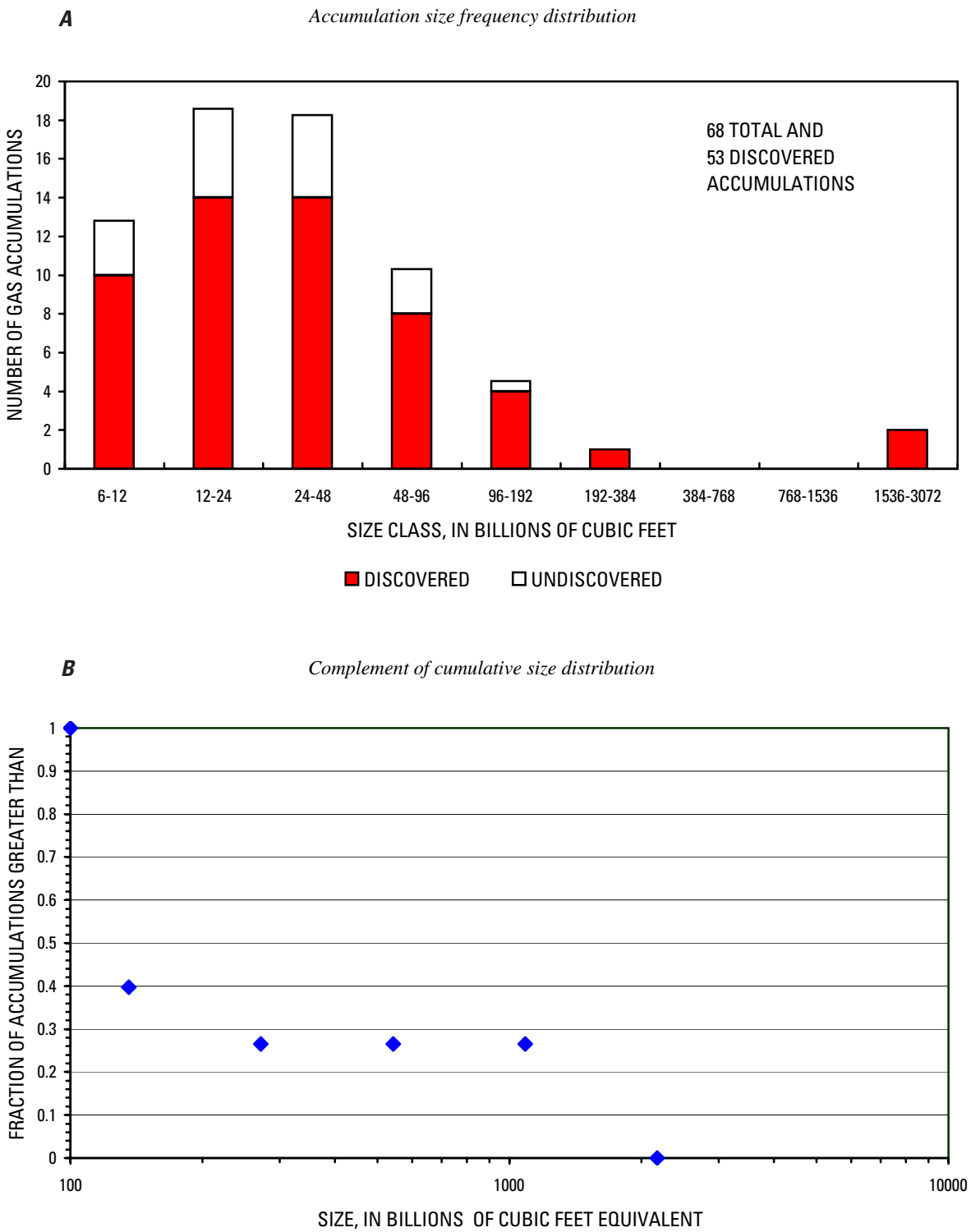

Figure 42. *A*. Size-frequency distribution of discovered and expected undiscovered gas accumulations where the minimum accumulation size is 6 billion cubic feet of gas equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 100 billion cubic feet of gas equivalent.

Gas: Play 4406–"Upper Pennsylvanian, Northwestern and Eastern Shelves, Northern Delaware and Midland Basins and Northern Central Basin Platform;" Permian Basin

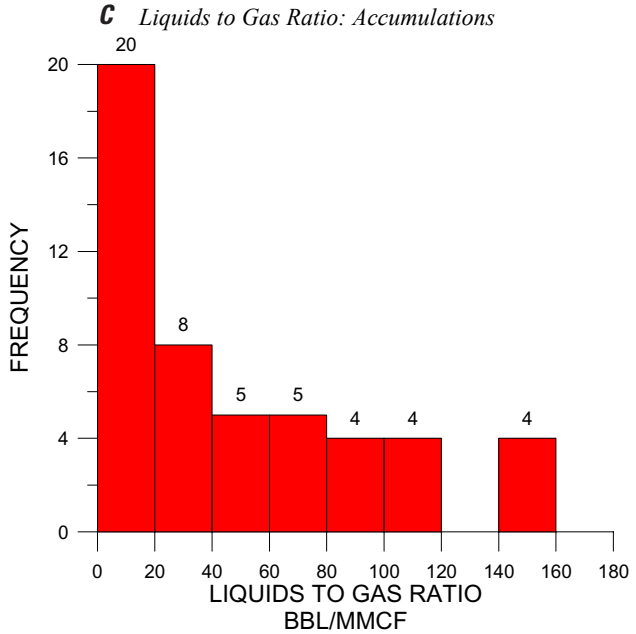

Figure 42. Continued. *C*. Histogram of liquids to gas ratios, in barrels per million cubic feet, of discovered gas accumulations.

Table 46. Numbers of discovered gas accumulations and volume of known gas recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Gas Accumulations Number	Gas Accumulations Percent of Play	Gas Volume BCF	Gas Volume Percent of Play
		By lithology				
4406	conglomerate		1	2	7	0.2
4406	dolomite	limestone	1	2	34	0.8
4406	dolomite		2	4	2,313	58
4406	limestone	chert	1	2	14	0.3
4406	limestone	conglomerate	1	2	96	2.4
4406	limestone		37	74	724	18.2
4406	limestone	sandstone	1	2	17	0.4
4406	sandstone		6	12	781	19.6
PLAY TOTAL			50	100	3,986	100
USGS Play Number	**Trap type**		**Number**	**Percent of Play**	**BCF**	**Percent of Play**
		By trap type				
4406	combination		21	42	2,814	70.6
4406	stratigraphic		17	34	944	23.7
4406	structural		2	4	73	1.8
PLAY SUBTOTAL			40	80	3,832	96.1

Gas: Play 4407–"Upper Pennsylvanian and Lower Permian Shelf, Slope and Basin Sandstones;" Permian Basin

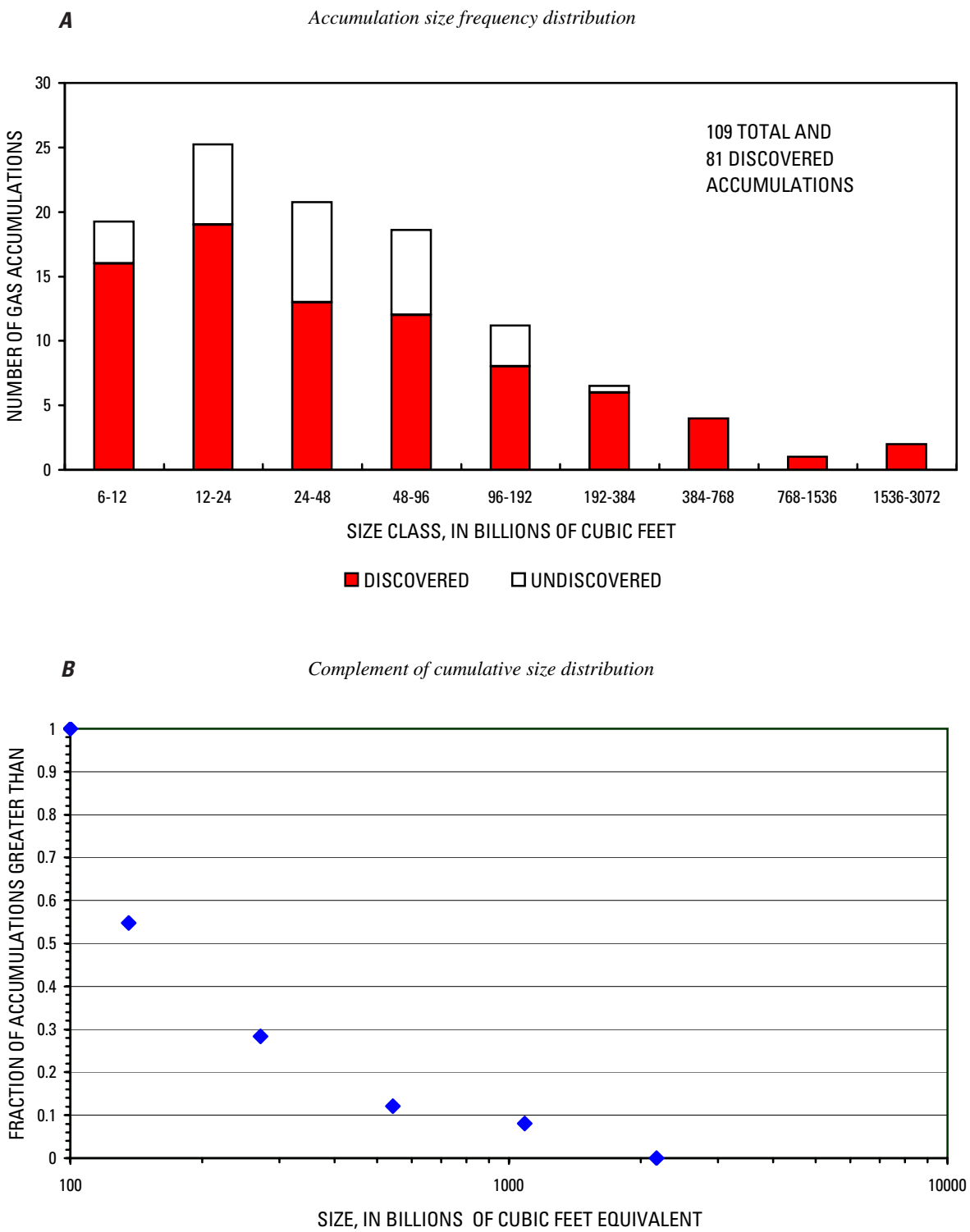

Figure 43. *A*. Size-frequency distribution of discovered and expected undiscovered gas accumulations where the minimum accumulation size is 6 billion cubic feet of gas equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 100 billion cubic feet of gas equivalent.

Gas: Play 4407–"Upper Pennsylvanian and Lower Permian Shelf, Slope and Basin Sandstones;" Permian Basin

C *Liquids to Gas Ratio: Accumulations*

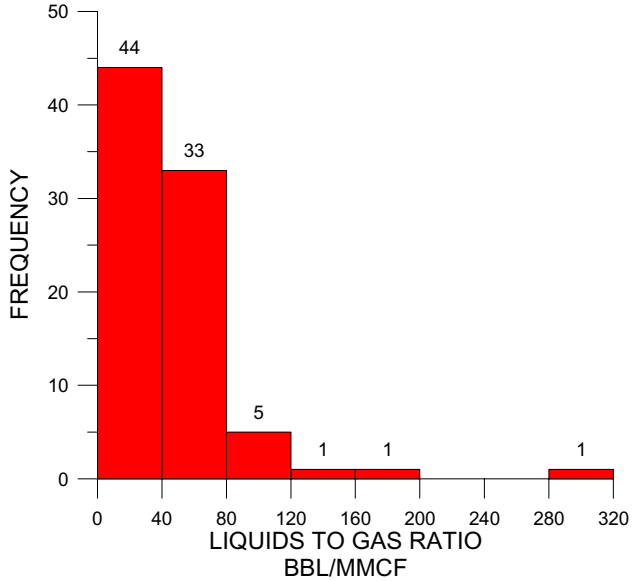

Figure 43. Continued. *C*. Histogram of liquids to gas ratios, in barrels per million cubic feet, of discovered gas accumulations.

Table 47. Numbers of discovered gas accumulations and volume of known gas recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Gas Accumulations Number	Gas Accumulations Percent of Play	Gas Volume BCF	Gas Volume Percent of Play
		By lithology				
4407	chert	conglomerate	1	1.2	4	0.1
4407	conglomerate	limestone	3	3.5	606	8.1
4407	granite wash		1	1.2	8	0.1
4407	limestone	anhydrite	1	1.2	14	0.2
4407	limestone		23	27.1	1,047	14
4407	limestone	sandstone	5	5.9	95	1.3
4407	limestone	shale	1	1.2	155	2.1
4407	sandstone		49	57.6	5,542	74
4407	sandstone	shale	1	1.2	16	0.2
PLAY TOTAL			85	100	7,486	100
USGS Play Number	**Trap type**		**Number**	**Percent of Play**	**BCF**	**Percent of Play**
		By trap type				
4407	combination		31	36.5	5,250	70.1
4407	stratigraphic		29	34.1	1,335	17.8
4407	structural		9	10.6	276	3.7
PLAY SUBTOTAL			69	81.2	6,861	91.6

Gas: Play 4410–"San Andres–Clearfork, Central Basin Platform and Ozona Arch;" Permian Basin

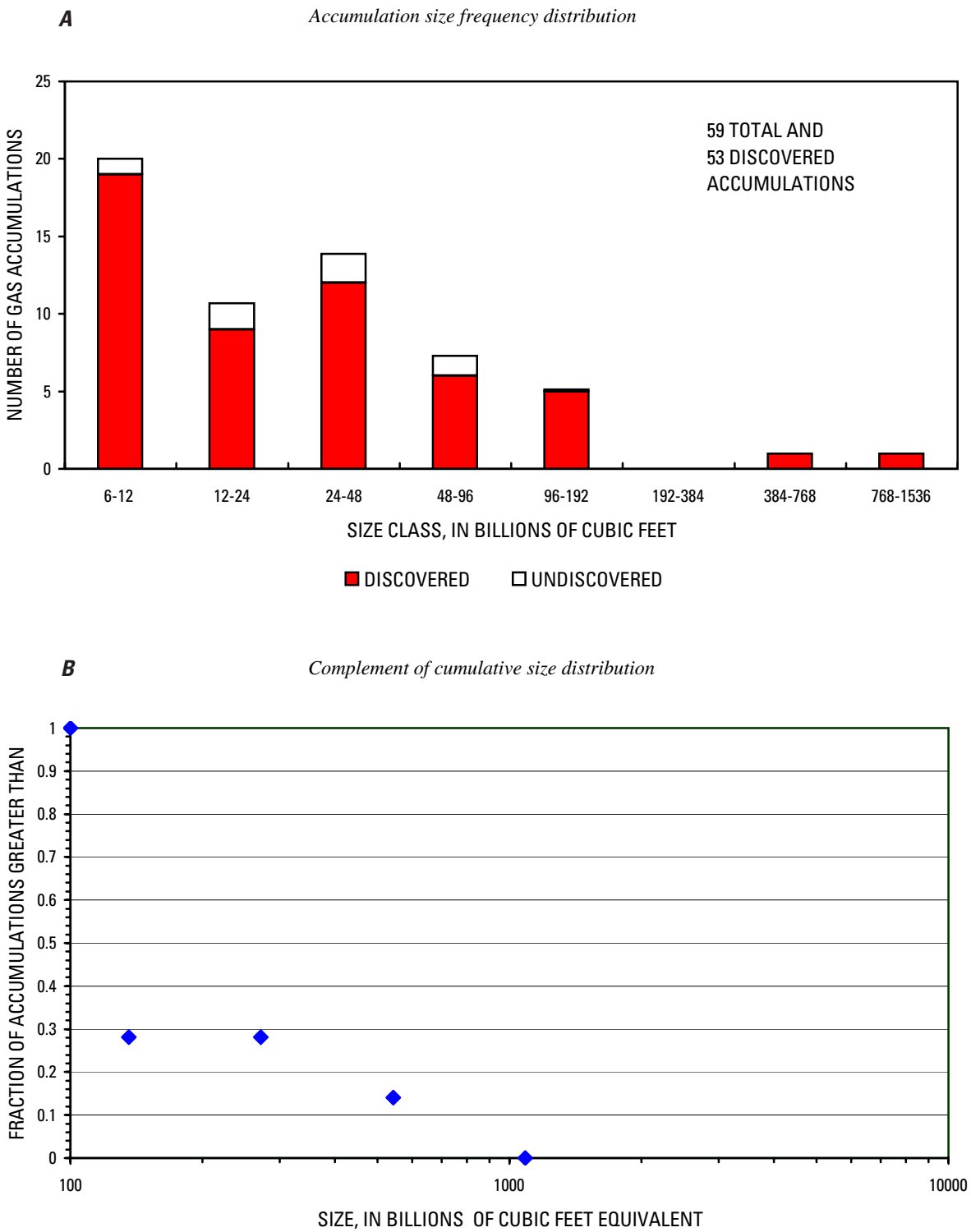

Figure 44. *A*. Size-frequency distribution of discovered and expected undiscovered gas accumulations where the minimum accumulation size is 6 billion cubic feet of gas equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 100 billion cubic feet of gas equivalent.

Gas: Play 4410–"San Andres–Clearfork, Central Basin Platform and Ozona Arch;" Permian Basin

C *Liquids to Gas Ratio: Accumulations*

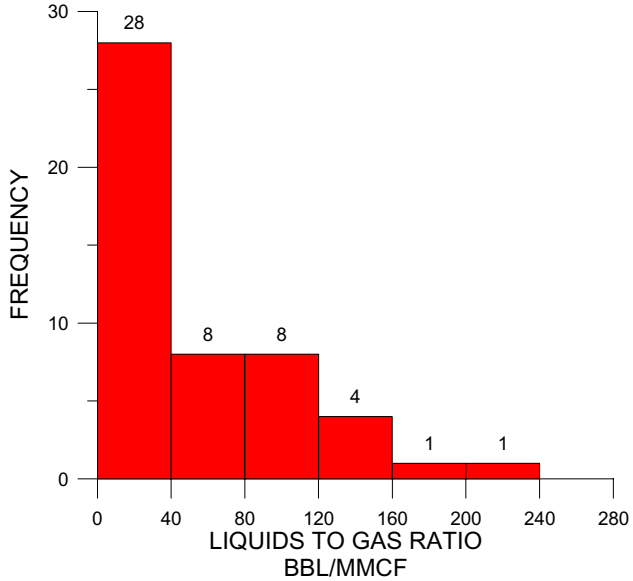

Figure 44. Continued. *C*. Histogram of liquids to gas ratios, in barrels per million cubic feet, of discovered gas accumulations.

Table 48. Numbers of discovered gas accumulations and volume of known gas recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Gas Accumulations Number	Gas Accumulations Percent of Play	Gas Volume BCF	Gas Volume Percent of Play
		By lithology				
4410	chert	limestone	1	2	8	0.1
4410	dolomite	limestone	3	6	65	0.7
4410	dolomite		12	24	424	4.6
4410	dolomite	sandstone	1	2	10	0.1
4410	limestone	dolomite	1	2	41	0.4
4410	limestone		7	14	177	1.9
4410	limestone	sandstone	1	2	24	0.3
4410	sandstone	dolomite	5	10	8,203	88.5
4410	sandstone		19	38	316	3.4
PLAY TOTAL			50	100	9,267	100

USGS Play Number	Trap type	Number	Percent of Play	BCF	Percent of Play
	By trap type				
4410	combination	38	76	9,133	98.5
4410	stratigraphic	3	6	27	0.3
4410	structural	1	2	8	0.1
PLAY SUBTOTAL		42	84	9,168	98.9

Gas: Play 4504–Lower Pennsylvanian (Bend) Sandstone and Conglomerate; Bend Arch–Ft. Worth Basin

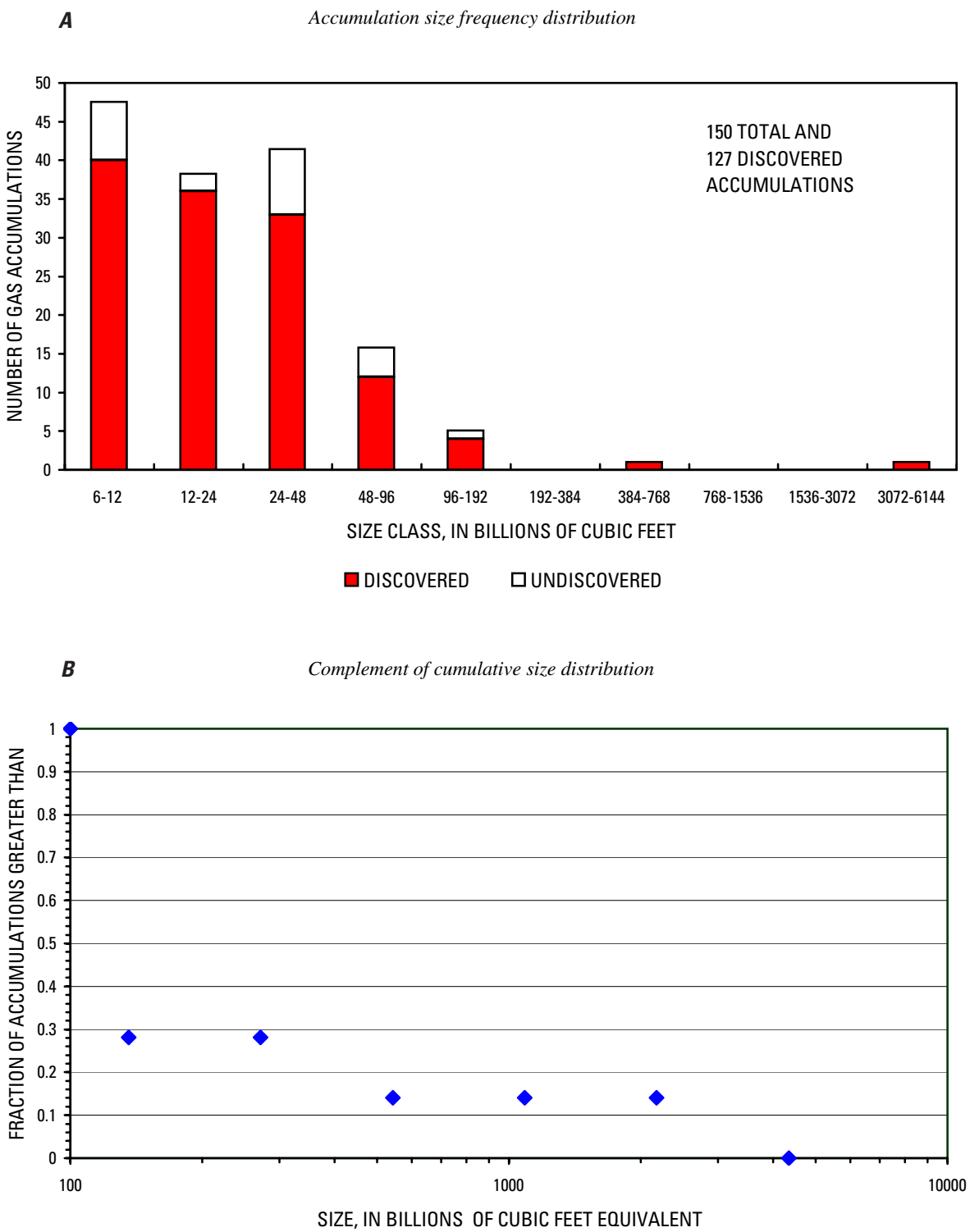

Figure 45. *A*. Size-frequency distribution of discovered and expected undiscovered gas accumulations where the minimum accumulation size is 6 billion cubic feet of gas equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 100 billion cubic feet of gas equivalent.

Gas: Play 4504–Lower Pennsylvanian (Bend) Sandstone and Conglomerate; Bend Arch–Ft. Worth Basin

C *Liquids to Gas Ratio: Accumulations*

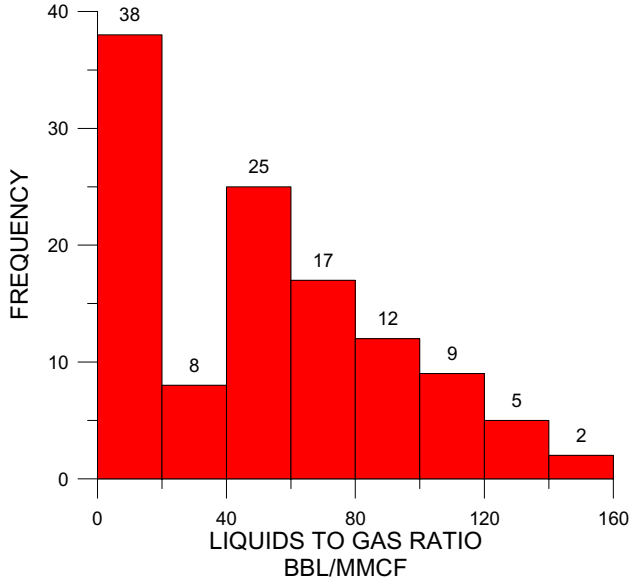

Figure 45. Continued. *C*. Histogram of liquids to gas ratios, in barrels per million cubic feet, of discovered gas accumulations.

Table 49. Numbers of discovered gas accumulations and volume of known gas recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Gas Accumulations Number	Gas Accumulations Percent of Play	Gas Volume BCF	Gas Volume Percent of Play
		By lithology				
4504	conglomerate	limestone	8	6.9	111	2
4504	conglomerate		74	63.8	1,401	25.9
4504	conglomerate	sandstone	9	7.8	2,990	55.3
4504	conglomerate	shale	1	0.9	41	0.8
4504	limestone	conglomerate	2	1.7	28	0.5
4504	limestone		10	8.6	243	4.5
4504	sandstone	conglomerate	5	4.3	155	2.9
4504	sandstone		7	6	444	8.2
PLAY TOTAL			116	100	5,412	100
USGS Play Number	Trap type		Number	Percent of Play	BCF	Percent of Play
		By trap type				
4504	combination		42	36.2	4,168	77
4504	stratigraphic		22	19	341	6.3
4504	structural		14	12.1	256	4.7
PLAY SUBTOTAL			78	67.3	4,765	88

Gas: Play 4718–Lower Wilcox Lobo Gas; Western Gulf

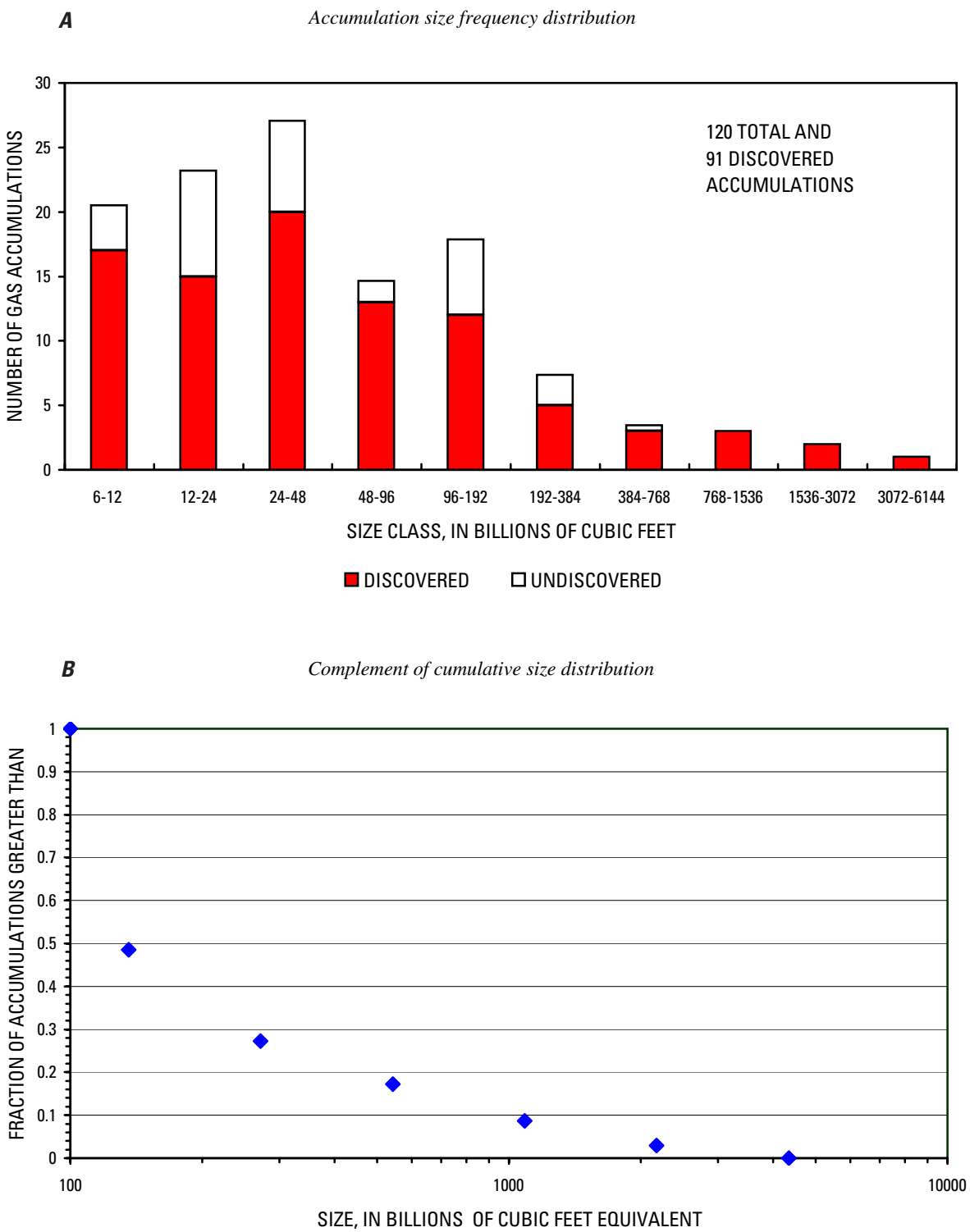

Figure 46. *A*. Size-frequency distribution of discovered and expected undiscovered gas accumulations where the minimum accumulation size is 6 billion cubic feet of gas equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 100 billion cubic feet of gas equivalent.

Gas: Play 4718–Lower Wilcox Lobo Gas; Western Gulf

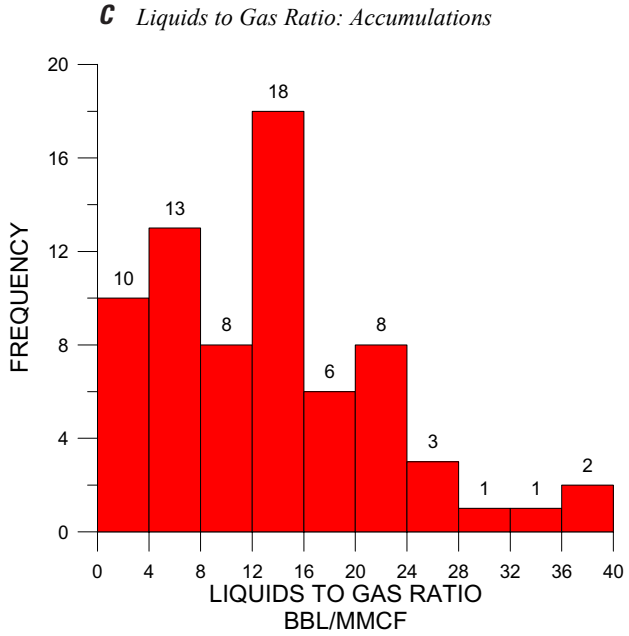

Figure 46. Continued. *C*. Histogram of liquids to gas ratios, in barrels per million cubic feet, of discovered gas accumulations.

Table 50. Numbers of discovered gas accumulations and volume of known gas recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Gas Accumulations Number	Gas Accumulations Percent of Play	Gas Volume BCF	Gas Volume Percent of Play
		By lithology				
4718	sandstone		70	100	10,355	100
PLAY TOTAL			70	100	10,355	100
USGS Play Number	**Trap type**		**Number**	**Percent of Play**	**BCF**	**Percent of Play**
		By trap type				
4718	combination		9	12.9	2,217	21.4
4718	structural		29	41.4	6,995	67.6
PLAY SUBTOTAL			38	54.3	9,213	89

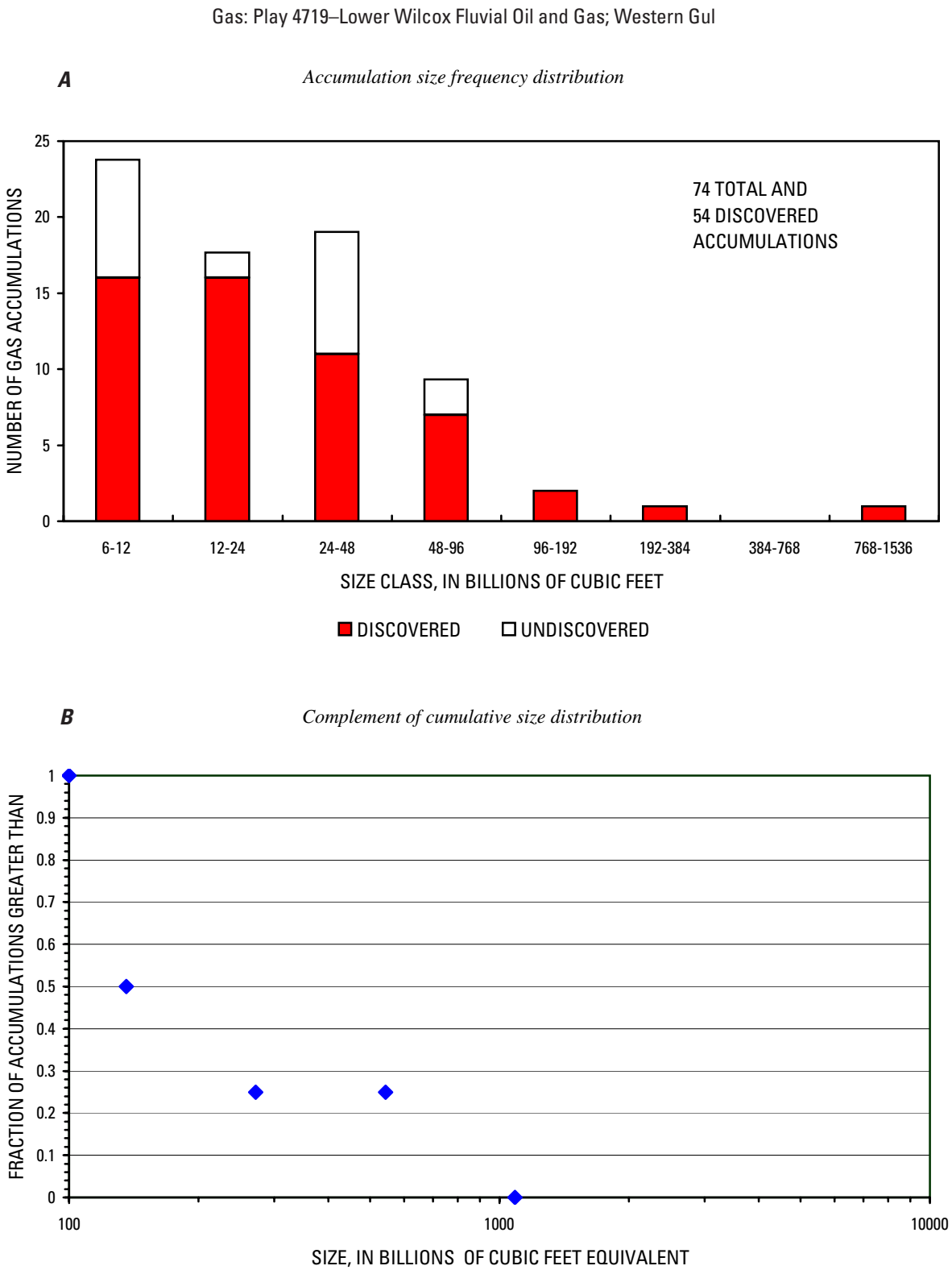

Figure 47. *A*. Size-frequency distribution of discovered and expected undiscovered gas accumulations where the minimum accumulation size is 6 billion cubic feet of gas equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 100 billion cubic feet of gas equivalent.

Gas: Play 4719–Lower Wilcox Fluvial Oil and Gas; Western Gul

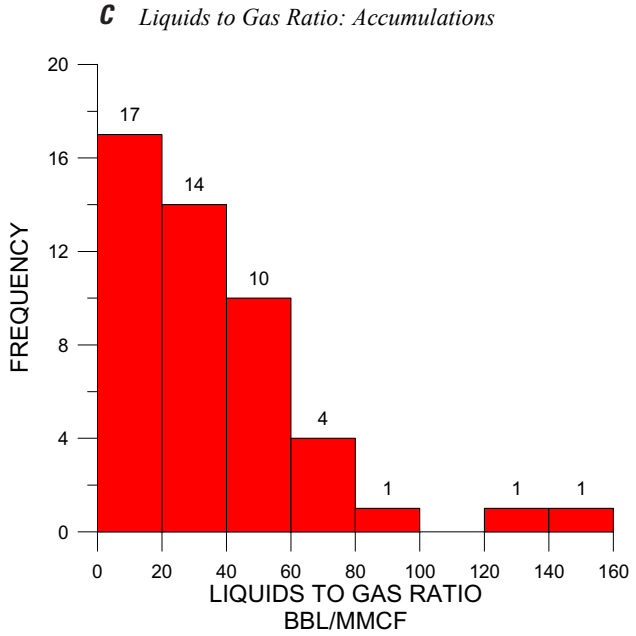

Figure 47. Continued. *C*. Histogram of liquids to gas ratios, in barrels per million cubic feet, of discovered gas accumulations.

Table 51. Numbers of discovered gas accumulations and volume of known gas recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Gas Accumulations Number	Gas Accumulations Percent of Play	Gas Volume BCF	Gas Volume Percent of Play
		By lithology				
4719	sandstone		48	100	2,331	100
PLAY TOTAL			48	100	2,331	100
USGS Play Number	**Trap type**		**Number**	**Percent of Play**	**BCF**	**Percent of Play**
		By trap type				
4719	combination		16	33.3	1,623	69.6
4719	stratigraphic		1	2.1	35	1.5
4719	structural		10	20.8	140	6
PLAY SUBTOTAL			27	56.2	1,799	77.1

Gas: Play 4722–Upper Wilcox Shelf–Edge Gas and Oil; Western Gulf

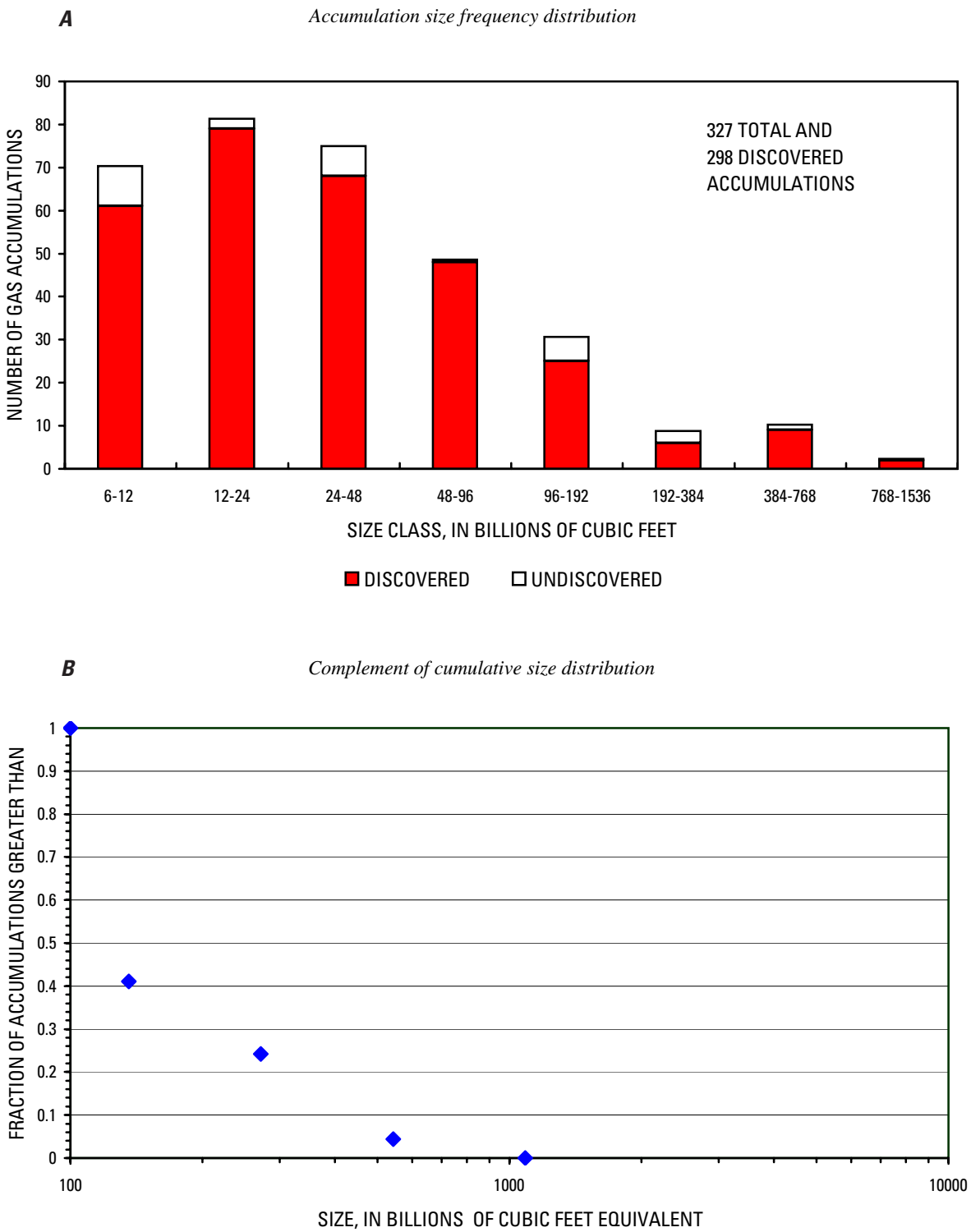

Figure 48. *A*. Size-frequency distribution of discovered and expected undiscovered gas accumulations where the minimum accumulation size is 6 billion cubic feet of gas equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 100 billion cubic feet of gas equivalent.

Gas: Play 4722–Upper Wilcox Shelf–Edge Gas and Oil; Western Gulf

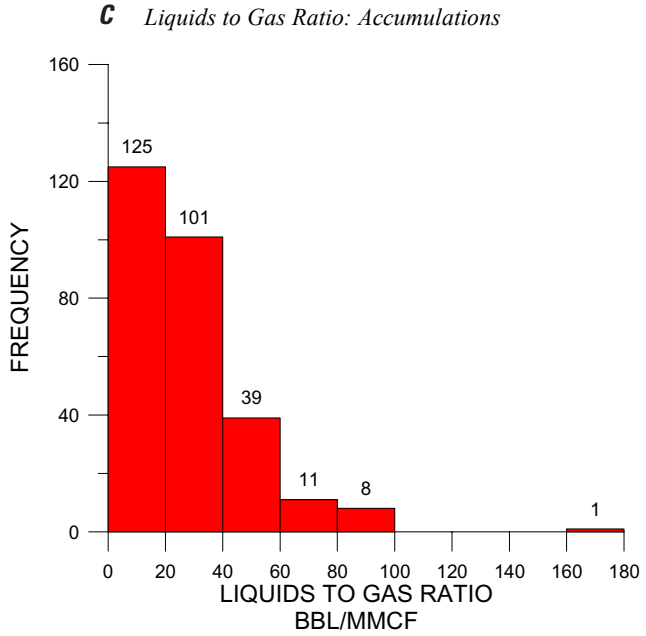

Figure 48. Continued. *C*. Histogram of liquids to gas ratios, in barrels per million cubic feet, of discovered gas accumulations.

Table 52. Numbers of discovered gas accumulations and volume of known gas recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Gas Accumulations Number	Gas Accumulations Percent of Play	Gas Volume BCF	Gas Volume Percent of Play
		By lithology				
4722	sandstone		285	100	13,604	100
PLAY TOTAL			285	100	13,604	100
USGS Play Number	**Trap type**		**Number**	**Percent of Play**	**BCF**	**Percent of Play**
		By trap type				
4722	combination		81	28.4	6,237	45.8
4722	stratigraphic		4	1.4	48	0.4
4722	structural		132	46.3	4,860	35.7
PLAY SUBTOTAL			217	76.1	11,146	81.9

Gas: Play 4723–Upper Wilcox Downdip Overpressured Gas; Western Gulf

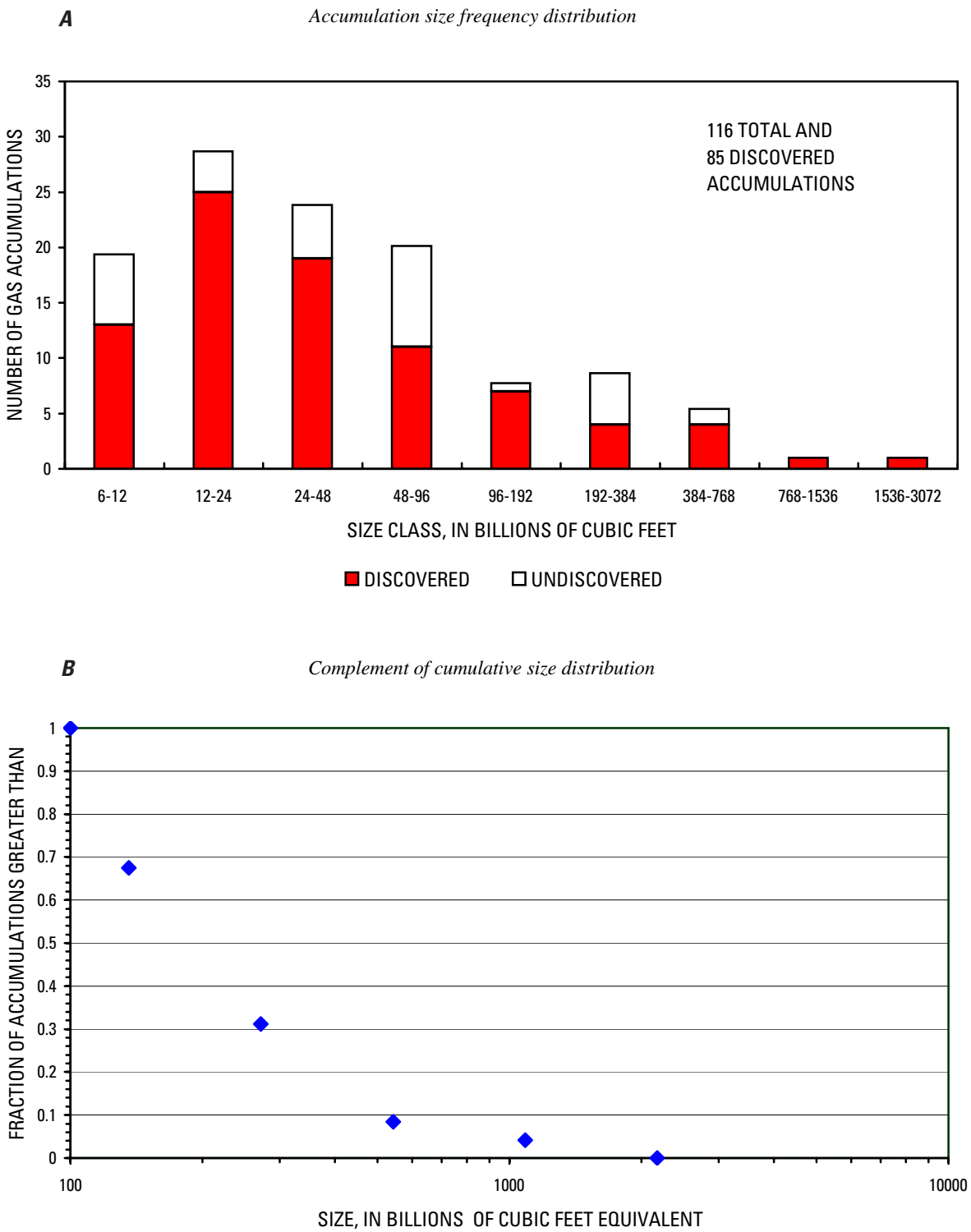

Figure 49. *A*. Size-frequency distribution of discovered and expected undiscovered gas accumulations where the minimum accumulation size is 6 billion cubic feet of gas equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 100 billion cubic feet of gas equivalent.

Gas: Play 4723–Upper Wilcox Downdip Overpressured Gas; Western Gulf

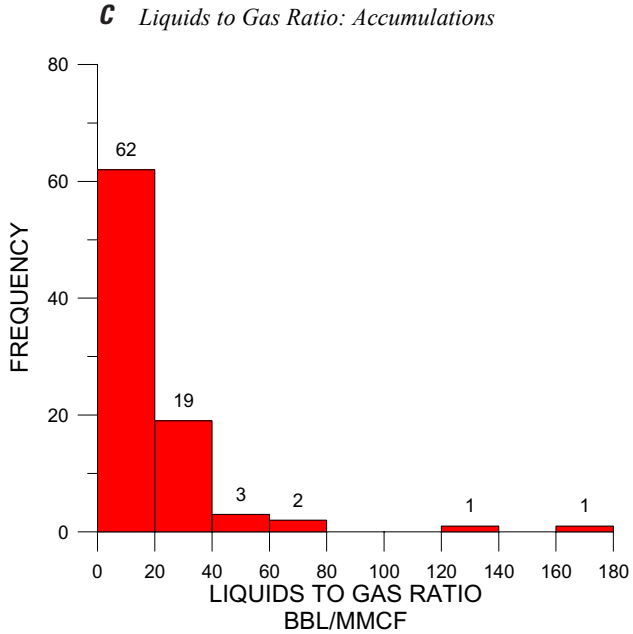

Figure 49. Continued. *C*. Histogram of liquids to gas ratios, in barrels per million cubic feet, of discovered gas accumulations.

Table 53. Numbers of discovered gas accumulations and volume of known gas recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Gas Accumulations Number	Gas Accumulations Percent of Play	Gas Volume BCF	Gas Volume Percent of Play
		By lithology				
4723	sandstone		87	98.9	5,108	100
4723	sandstone	shale	1	1.1	7	0.1
PLAY TOTAL			88	100	5,115	100
USGS Play Number	**Trap type**		**Number**	**Percent of Play**	**BCF**	**Percent of Play**
		By trap type				
4723	combination		16	18.2	583	11.4
4723	stratigraphic		1	1.1	7	0.1
4723	structural		40	45.5	3,327	65
PLAY SUBTOTAL			57	64.8	3,917	76.5

Gas: Play 4726–Yegua Updip Fluvial–Deltaic Oil and Gas; Western Gulf

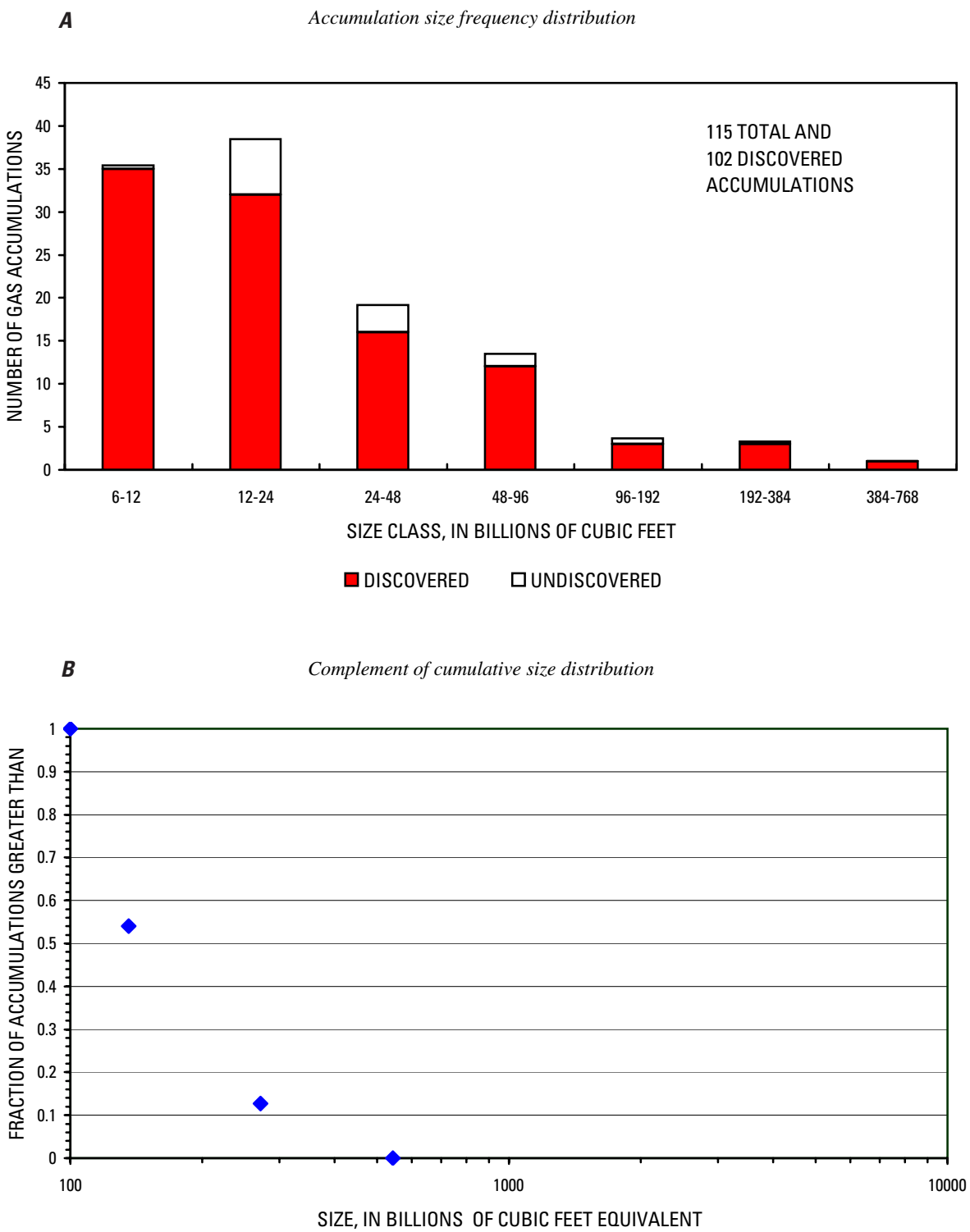

Figure 50. *A*. Size-frequency distribution of discovered and expected undiscovered gas accumulations where the minimum accumulation size is 6 billion cubic feet of gas equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 100 billion cubic feet of gas equivalent.

Gas: Play 4726–Yegua Updip Fluvial–Deltaic Oil and Gas; Western Gulf

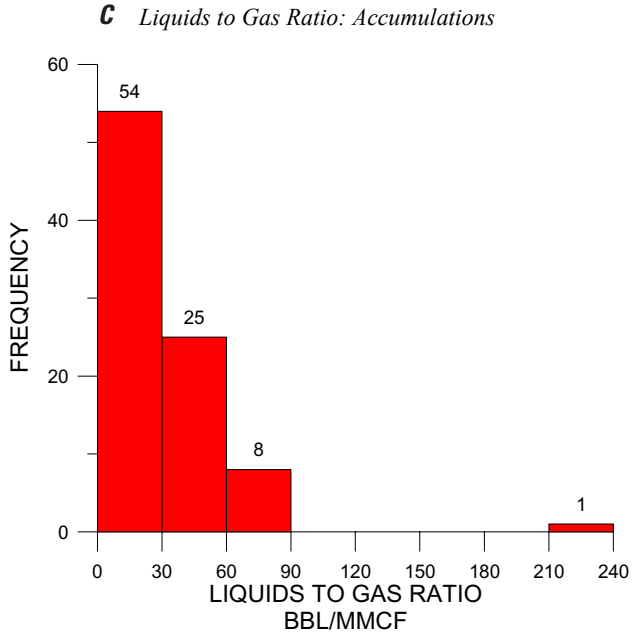

Figure 50. Continued. *C*. Histogram of liquids to gas ratios, in barrels per million cubic feet, of discovered gas accumulations.

Table 54. Numbers of discovered gas accumulations and volume of known gas recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Gas Accumulations Number	Gas Accumulations Percent of Play	Gas Volume BCF	Gas Volume Percent of Play
		By lithology				
4726	sandstone		88	100	2,325	100
PLAY TOTAL			88	100	2,325	100

USGS Play Number	Trap type	Number	Percent of Play	BCF	Percent of Play
	By trap type				
4726	combination	29	33	934	40.2
4726	stratigraphic	3	3.4	51	2.2
4726	structural	26	29.5	741	31.9
PLAY SUBTOTAL		58	65.9	1,726	74.3

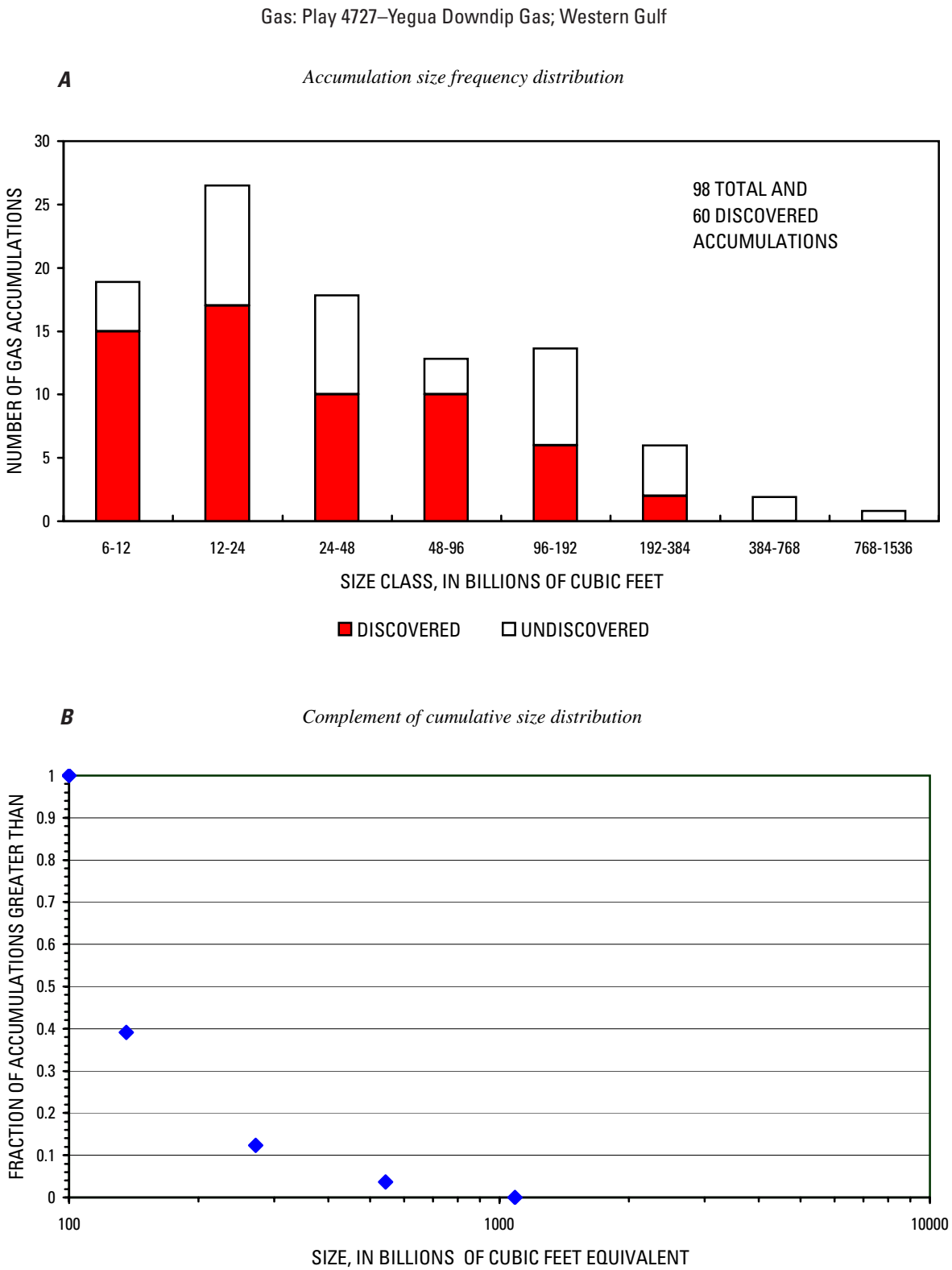

Figure 51. *A*. Size-frequency distribution of discovered and expected undiscovered gas accumulations where the minimum accumulation size is 6 billion cubic feet of gas equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 100 billion cubic feet of gas equivalent.

Gas: Play 4727–Yegua Downdip Gas; Western Gulf

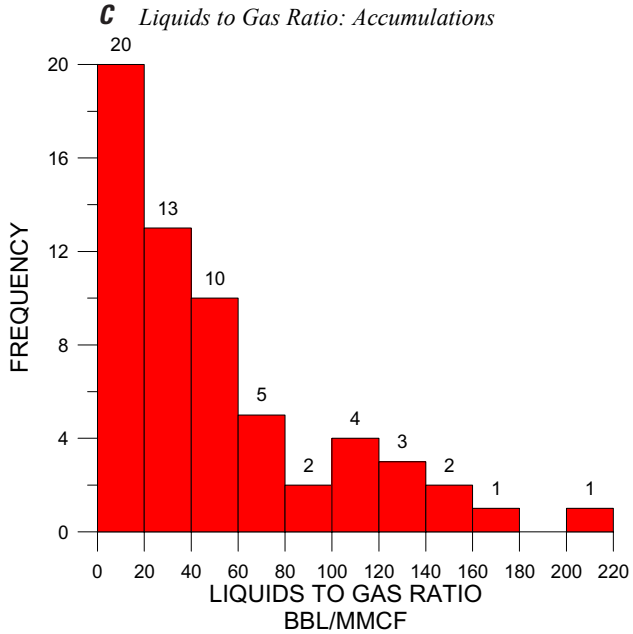

Figure 51. Continued. *C*. Histogram of liquids to gas ratios, in barrels per million cubic feet, of discovered gas accumulations.

Table 55. Numbers of discovered gas accumulations and volume of known gas recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Gas Accumulations Number	Gas Accumulations Percent of Play	Gas Volume BCF	Gas Volume Percent of Play
		By lithology				
4727	sandstone		61	100	1,495	100
PLAY TOTAL			61	100	1,495	100
USGS Play Number	**Trap type**		**Number**	**Percent of Play**	**BCF**	**Percent of Play**
		By trap type				
4727	combination		15	24.6	381	25.5
4727	stratigraphic		1	1.6	6	0.4
4727	structural		16	26.2	335	22.4
PLAY SUBTOTAL			32	52.4	721	48.3

Gas: Play 4731–Vicksburg Downdip Gas; Western Gulf

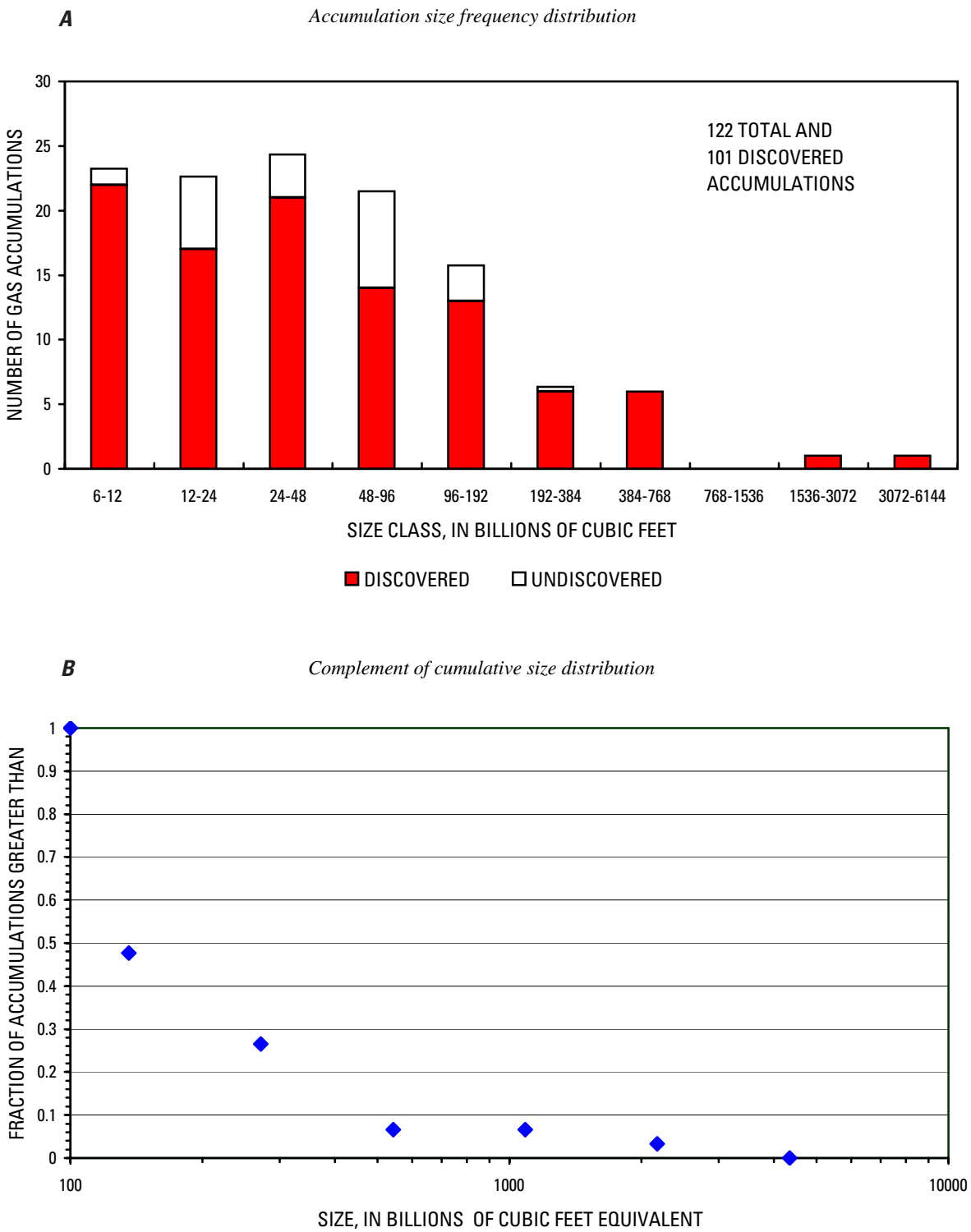

Figure 52. *A*. Size-frequency distribution of discovered and expected undiscovered gas accumulations where the minimum accumulation size is 6 billion cubic feet of gas equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 100 billion cubic feet of gas equivalent.

Gas: Play 4731–Vicksburg Downdip Gas; Western Gulf

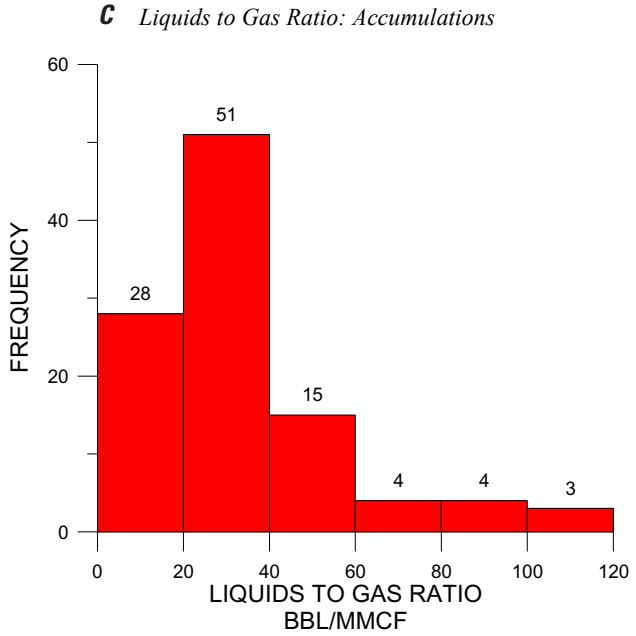

Figure 52. Continued. *C*. Histogram of liquids to gas ratios, in barrels per million cubic feet, of discovered gas accumulations.

Table 56. Numbers of discovered gas accumulations and volume of known gas recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Gas Accumulations Number	Gas Accumulations Percent of Play	Gas Volume BCF	Gas Volume Percent of Play
		By lithology				
4731	sandstone		105	100	9,097	100
PLAY TOTAL			105	100	9,097	100

USGS Play Number	Trap type	Number	Percent of Play	BCF	Percent of Play
	By trap type				
4731	combination	40	38.1	6,727	73.9
4731	stratigraphic	2	1.9	125	1.4
4731	structural	32	30.5	877	9.6
PLAY SUBTOTAL		74	70.5	7,729	84.9

Gas: Play 4732–Frio South Texas Downdip Gas; Western Gulf

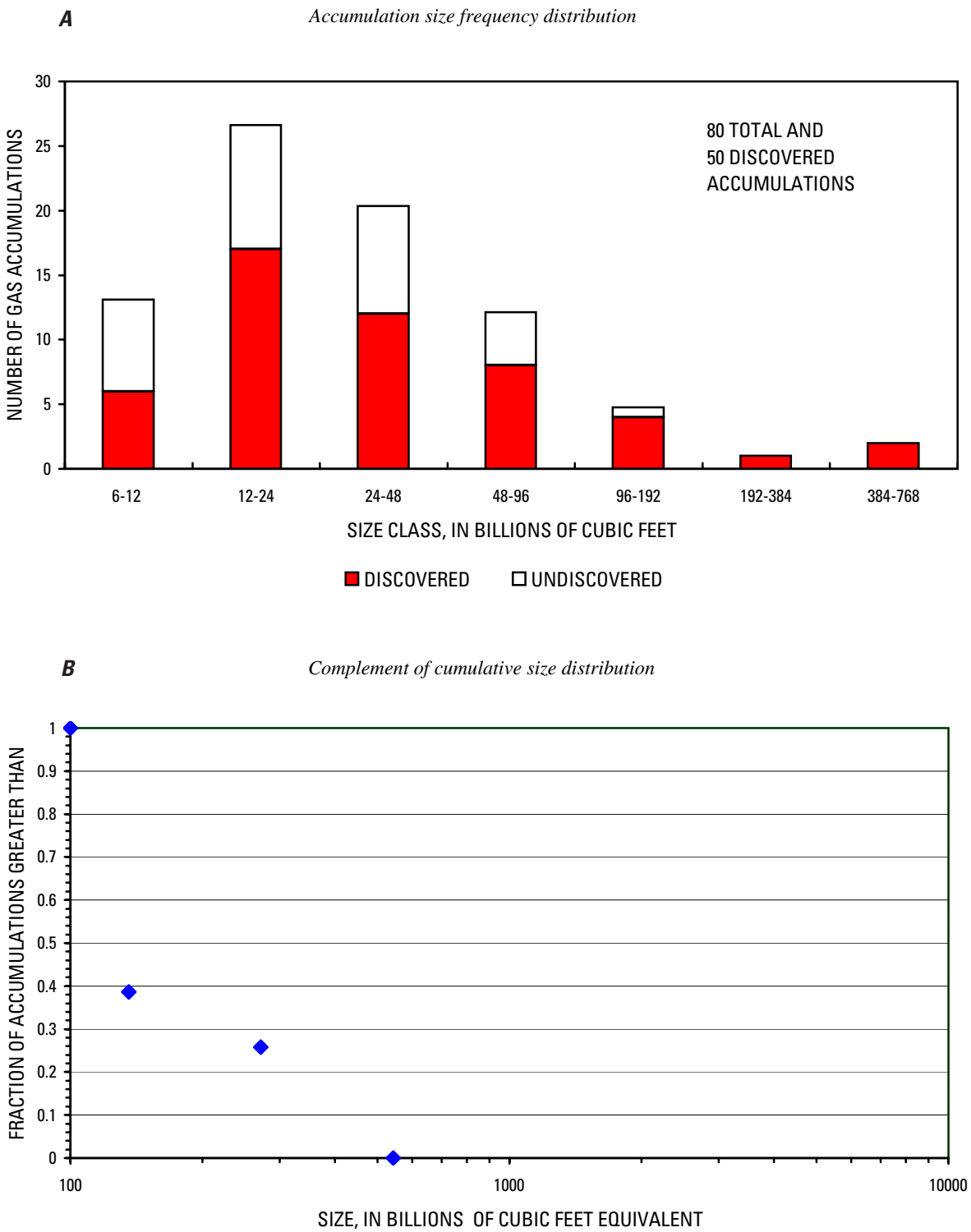

Figure 53. *A*. Size-frequency distribution of discovered and expected undiscovered gas accumulations where the minimum accumulation size is 6 billion cubic feet of gas equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 100 billion cubic feet of gas equivalent.

Gas: Play 4732–Frio South Texas Downdip Gas; Western Gulf

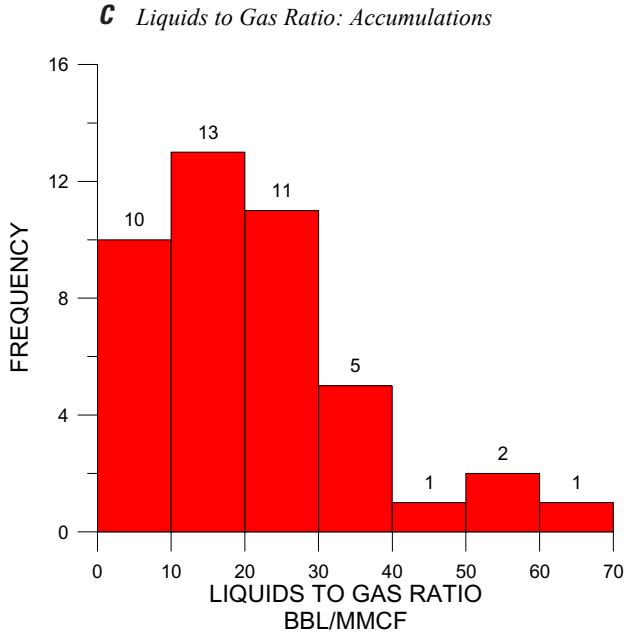

Figure 53. Continued. *C*. Histogram of liquids to gas ratios, in barrels per million cubic feet, of discovered gas accumulations.

Table 57. Numbers of discovered gas accumulations and volume of known gas recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Gas Accumulations Number	Gas Accumulations Percent of Play	Gas Volume BCF	Gas Volume Percent of Play
		By lithology				
4732	sandstone		42	97.7	2,270	95
4732	sandstone	shale	1	2.3	119	5
PLAY TOTAL			43	100	2,390	100
USGS Play Number	**Trap type**		**Number**	**Percent of Play**	**BCF**	**Percent of Play**
		By trap type				
4732	combination		4	9.3	52	2.2
4732	structural		24	55.8	1,642	68.7
PLAY SUBTOTAL			28	65.1	1,694	70.9

Gas: Play 4733–Frio South Texas Mid–Dip Oil and Gas; Western Gulf

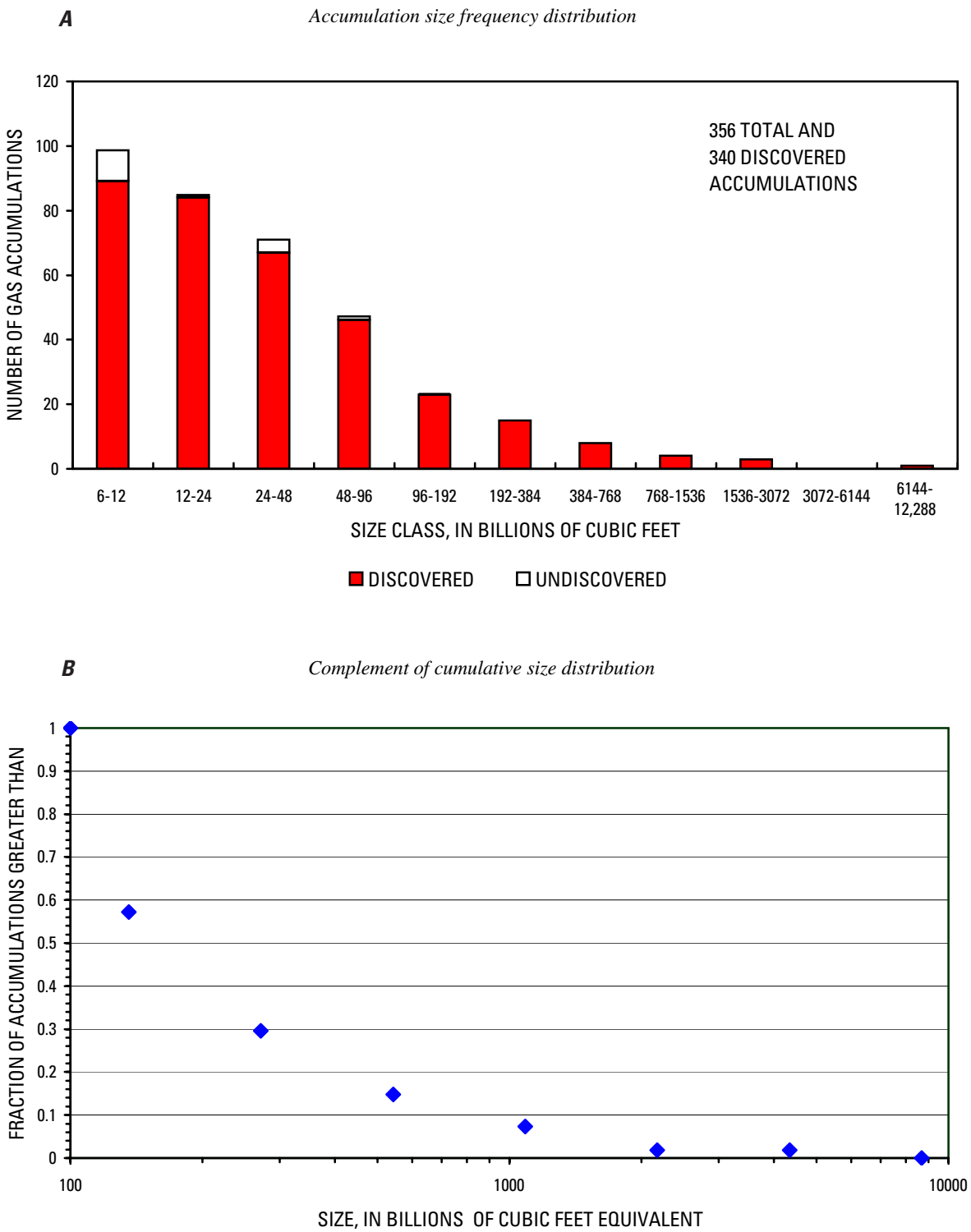

Figure 54. *A*. Size-frequency distribution of discovered and expected undiscovered gas accumulations where the minimum accumulation size is 6 billion cubic feet of gas equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 100 billion cubic feet of gas equivalent.

Gas: Play 4733–Frio South Texas Mid–Dip Oil and Gas; Western Gulf

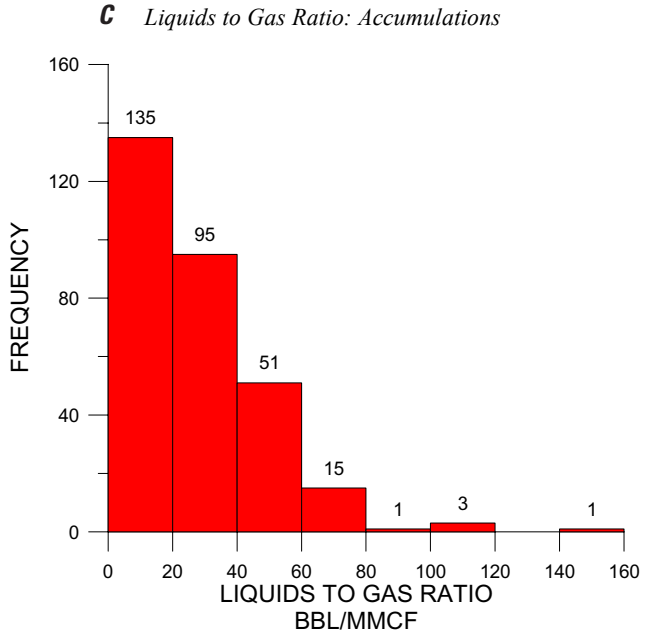

Figure 54. Continued. *C*. Histogram of liquids to gas ratios, in barrels per million cubic feet, of discovered gas accumulations.

Table 58. Numbers of discovered gas accumulations and volume of known gas recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Gas Accumulations Number	Gas Accumulations Percent of Play	Gas Volume BCF	Gas Volume Percent of Play
		By lithology				
4733	sandstone		295	98	25,223	95.9
4733	sandstone	shale	6	2	1,070	4.1
PLAY TOTAL			301	100	26,293	100
USGS Play Number	**Trap type**		**Number**	**Percent of Play**	**BCF**	**Percent of Play**
		By trap type				
4733	combination		92	30.6	18,131	69
4733	stratigraphic		3	1	175	0.7
4733	structural		140	46.5	6,153	23.4
PLAY SUBTOTAL			235	78.1	24,459	93.1

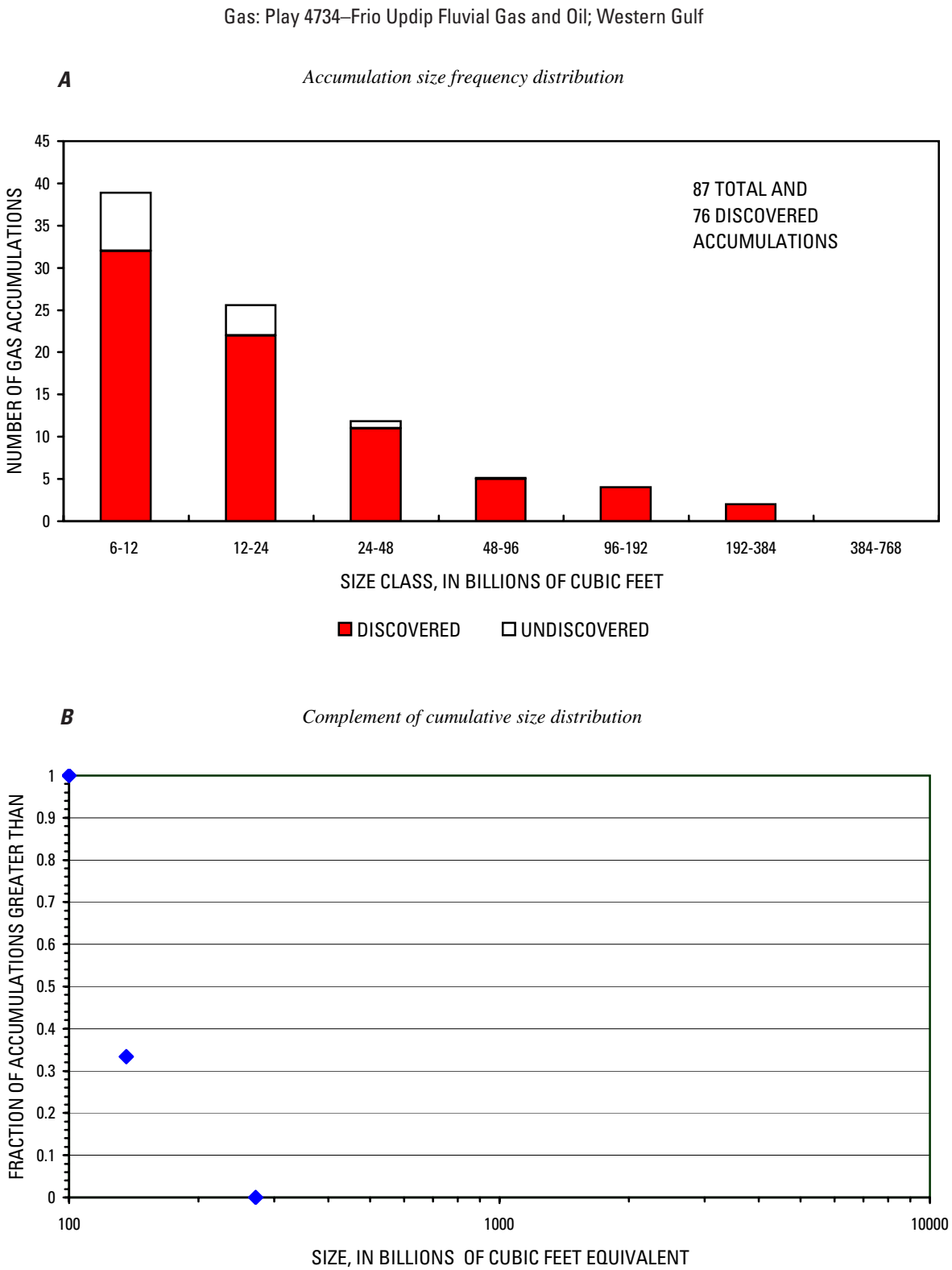

Figure 55. *A*. Size-frequency distribution of discovered and expected undiscovered gas accumulations where the minimum accumulation size is 6 billion cubic feet of gas equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 100 billion cubic feet of gas equivalent.

Gas: Play 4734–Frio Updip Fluvial Gas and Oil; Western Gulf

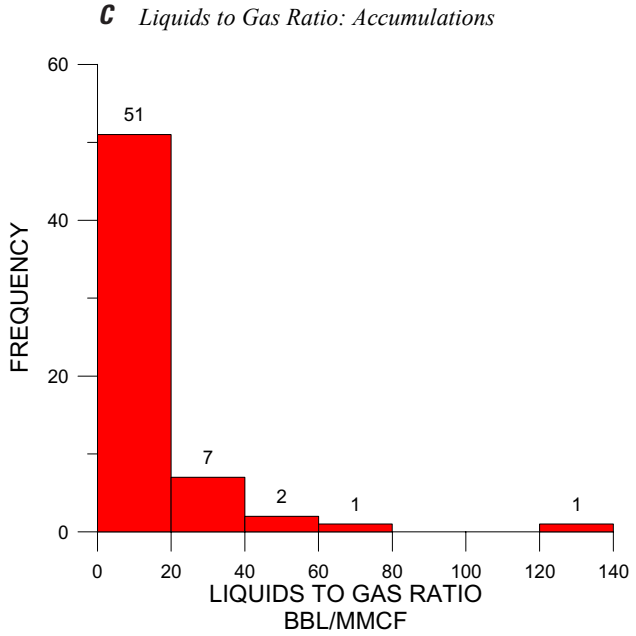

Figure 55. Continued. *C*. Histogram of liquids to gas ratios, in barrels per million cubic feet, of discovered gas accumulations.

Table 59. Numbers of discovered gas accumulations and volume of known gas recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Gas Accumulations Number	Gas Accumulations Percent of Play	Gas Volume BCF	Gas Volume Percent of Play
		By lithology				
4734	sandstone		62	100	1,832	100
PLAY TOTAL			62	100	1,832	100

USGS Play Number	Trap type	Number	Percent of Play	BCF	Percent of Play
	By trap type				
4734	combination	23	37.1	878	47.9
4734	stratigraphic	4	6.5	39	2.1
4734	structural	20	32.3	623	34
PLAY SUBTOTAL		47	75.9	1,539	84

Gas: Play 4735–Frio SE Texas/S. Louisiana Mid–Dip Gas and Oil; Western Gulf

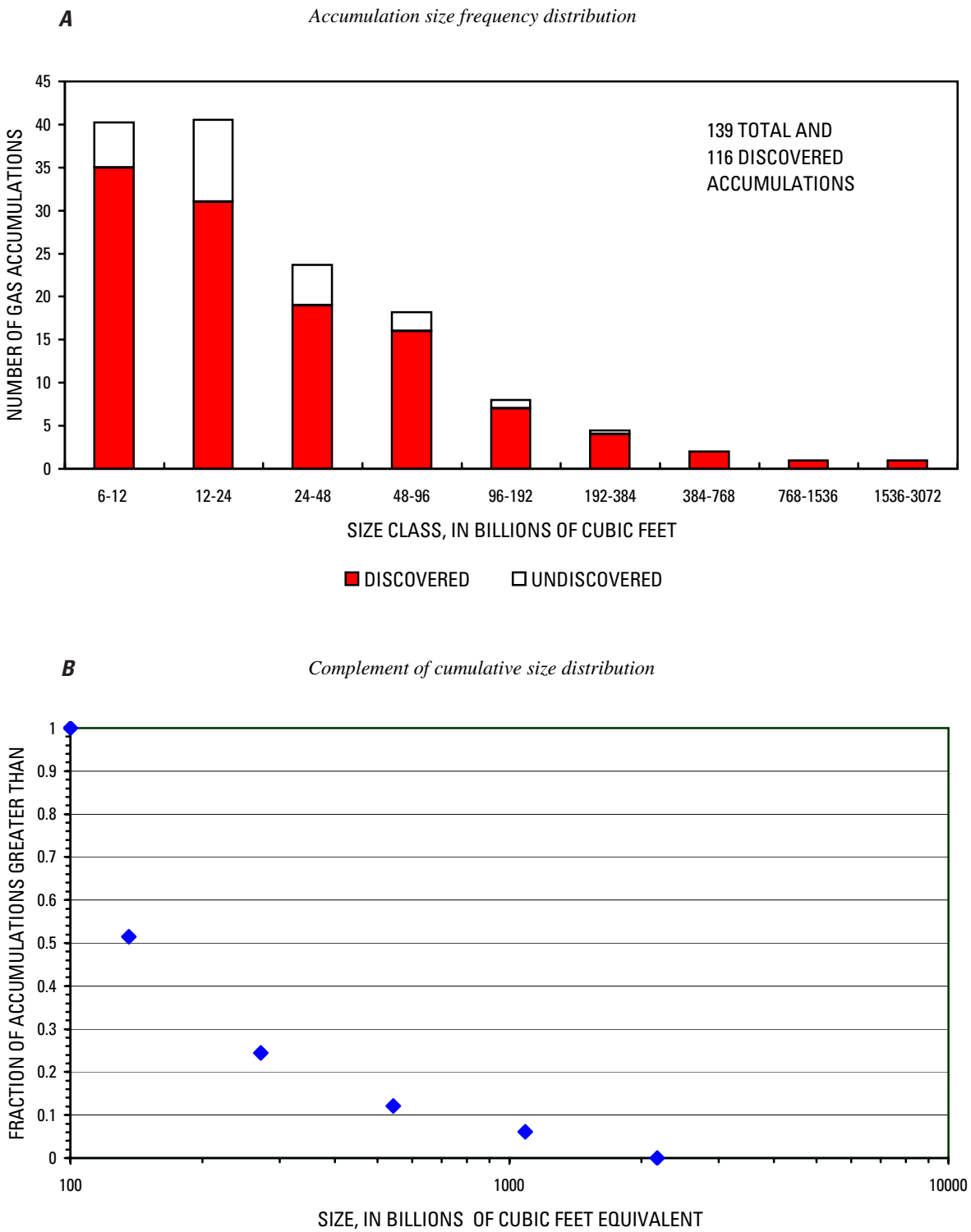

Figure 56. *A*. Size-frequency distribution of discovered and expected undiscovered gas accumulations where the minimum accumulation size is 6 billion cubic feet of gas equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 100 billion cubic feet of gas equivalent.

Gas: Play 4735–Frio SE Texas/S. Louisiana Mid–Dip Gas and Oil; Western Gulf

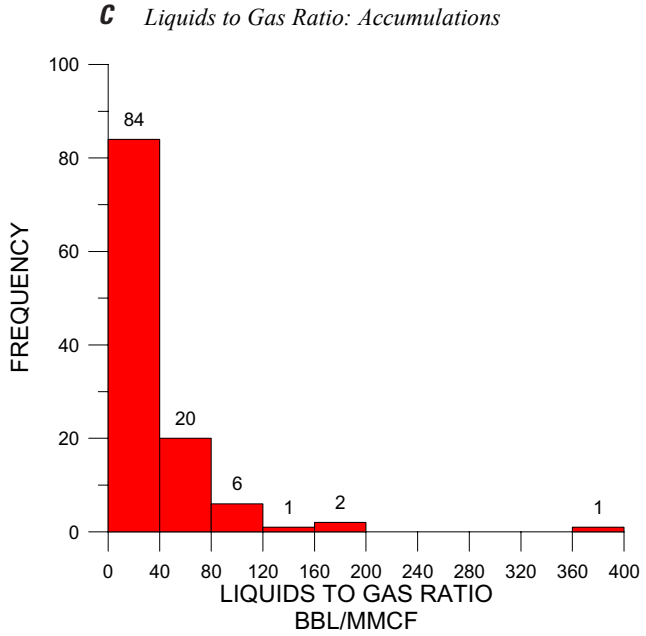

Figure 56. Continued. *C*. Histogram of liquids to gas ratios, in barrels per million cubic feet, of discovered gas accumulations.

Table 60. Numbers of discovered gas accumulations and volume of known gas recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Gas Accumulations Number	Gas Accumulations Percent of Play	Gas Volume BCF	Gas Volume Percent of Play
		By lithology				
4735	sandstone		113	99.1	6,423	99.3
4735	sandstone	shale	1	0.9	44	0.7
PLAY TOTAL			114	100	6,467	100
USGS Play Number	**Trap type**		**Number**	**Percent of Play**	**BCF**	**Percent of Play**
		By trap type				
4735	combination		38	33.3	4,043	62.5
4735	structural		47	41.2	1,916	29.6
PLAY SUBTOTAL			85	74.5	5,958	92.1

Gas: Play 4736–Frio SE Texas/S. Louisiana Downdip Gas; Western Gulf

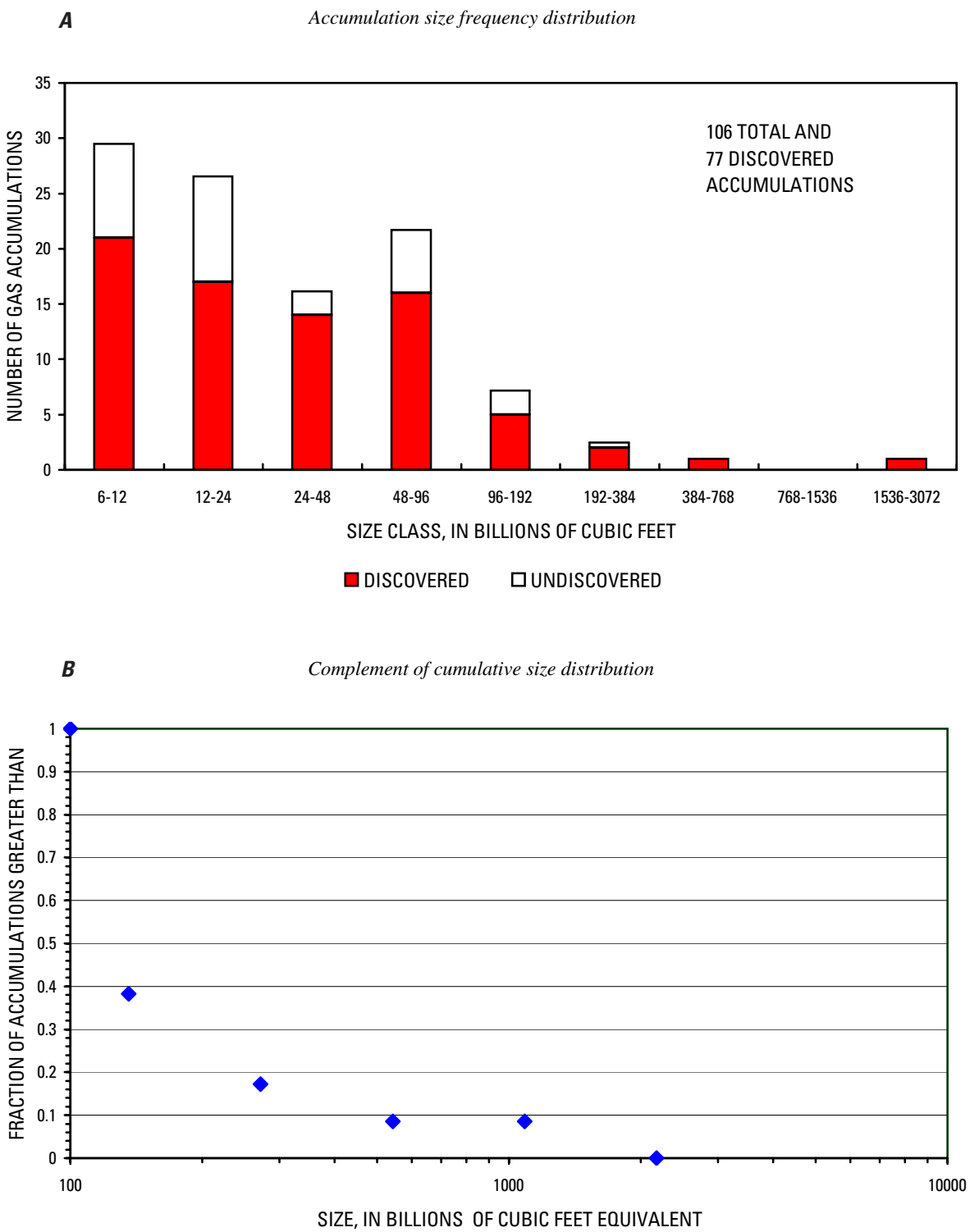

Figure 57. *A*. Size-frequency distribution of discovered and expected undiscovered gas accumulations where the minimum accumulation size is 6 billion cubic feet of gas equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 100 billion cubic feet of gas equivalent.

Gas: Play 4736–Frio SE Texas/S. Louisiana Downdip Gas; Western Gulf

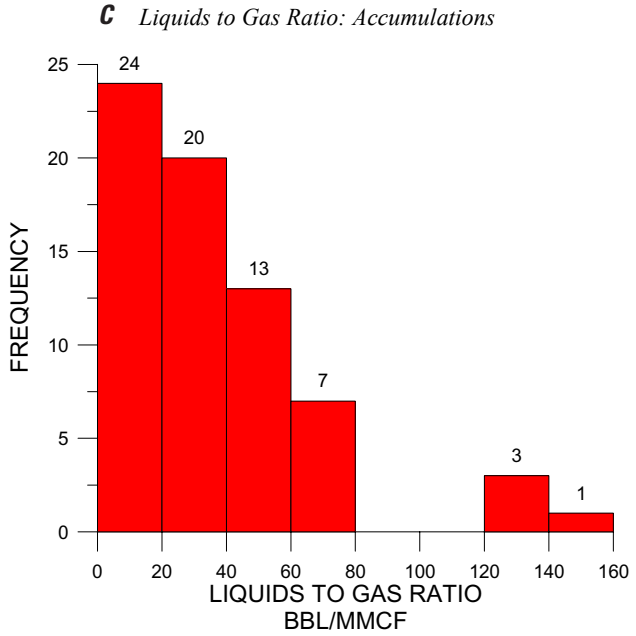

Figure 57. Continued. *C*. Histogram of liquids to gas ratios, in barrels per million cubic feet, of discovered gas accumulations.

Table 61. Numbers of discovered gas accumulations and volume of known gas recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Gas Accumulations Number	Gas Accumulations Percent of Play	Gas Volume BCF	Gas Volume Percent of Play
		By lithology				
4736	sandstone		68	100	4,238	100
PLAY TOTAL			68	100	4,238	100
USGS Play Number	**Trap type**		**Number**	**Percent of Play**	**BCF**	**Percent of Play**
		By trap type				
4736	combination		19	27.9	2,513	59.3
4736	structural		31	45.6	1,409	33.2
PLAY SUBTOTAL			50	73.5	3,922	92.5

Gas: Play 4739–Lower Miocene Fluvial Sandstone Oil and Gas; Western Gulf

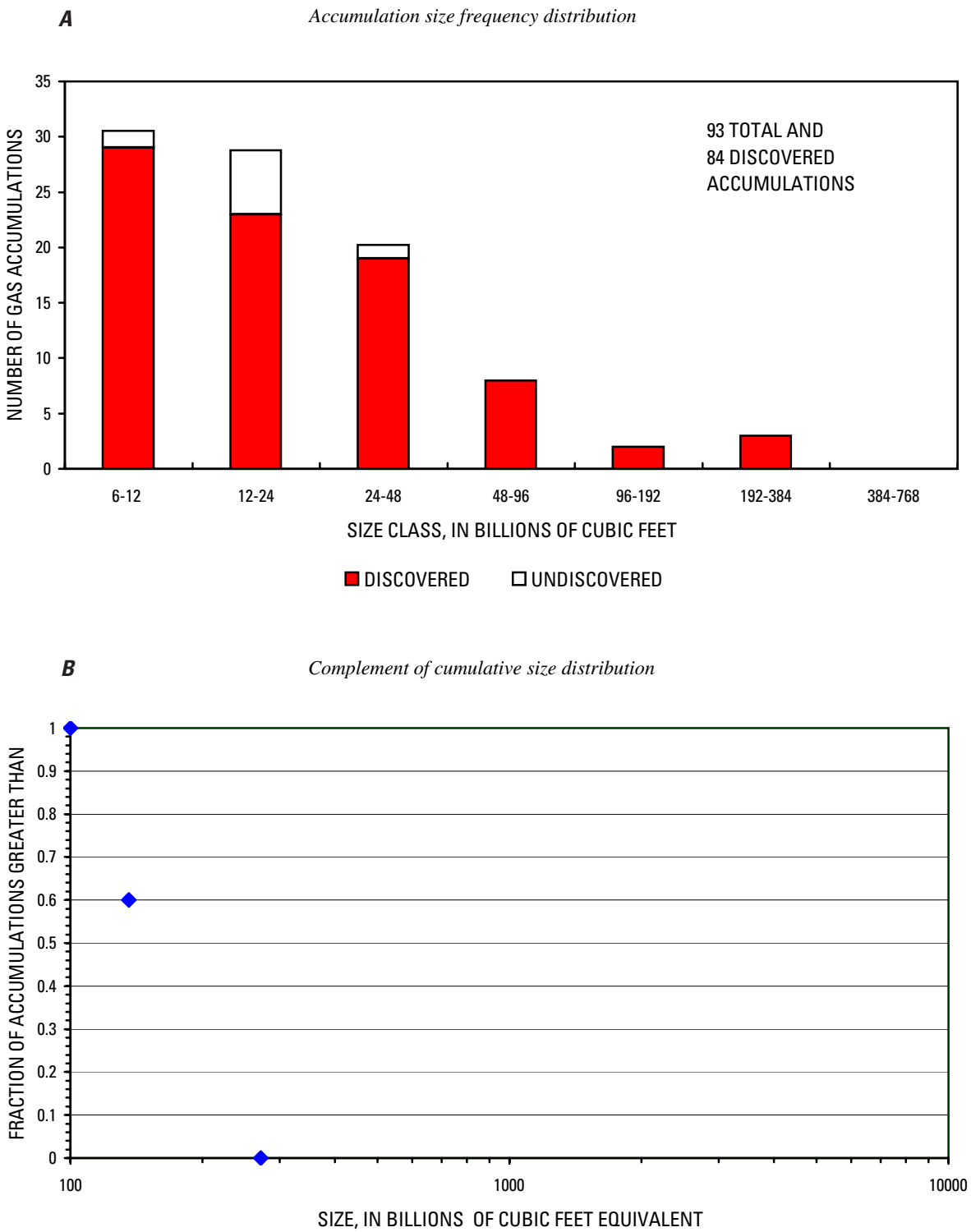

Figure 58. *A*. Size-frequency distribution of discovered and expected undiscovered gas accumulations where the minimum accumulation size is 6 billion cubic feet of gas equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 100 billion cubic feet of gas equivalent.

Gas: Play 4739–Lower Miocene Fluvial Sandstone Oil and Gas; Western Gulf

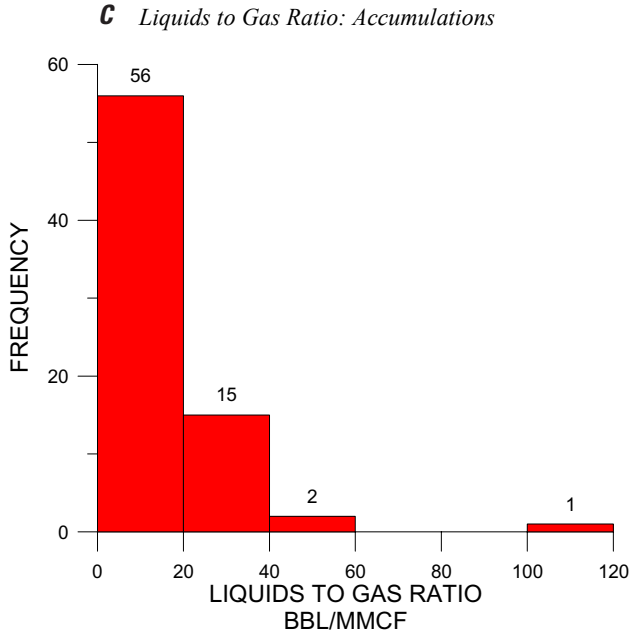

Figure 58. Continued. *C*. Histogram of liquids to gas ratios, in barrels per million cubic feet, of discovered gas accumulations.

Table 62. Numbers of discovered gas accumulations and volume of known gas recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Gas Accumulations Number	Gas Accumulations Percent of Play	Gas Volume BCF	Gas Volume Percent of Play
		By lithology				
4739	sandstone		74	100	2,382	100
PLAY TOTAL			74	100	2,382	100
USGS Play Number	**Trap type**		**Number**	**Percent of Play**	**BCF**	**Percent of Play**
		By trap type				
4739	combination		36	48.6	1,335	56
4739	structural		30	40.5	948	39.8
PLAY SUBTOTAL			66	89.1	2,283	95.8

Gas: Play 4912–Smackover Salt Basins Gas and Oil; Louisiana–Mississippi Salt Basins

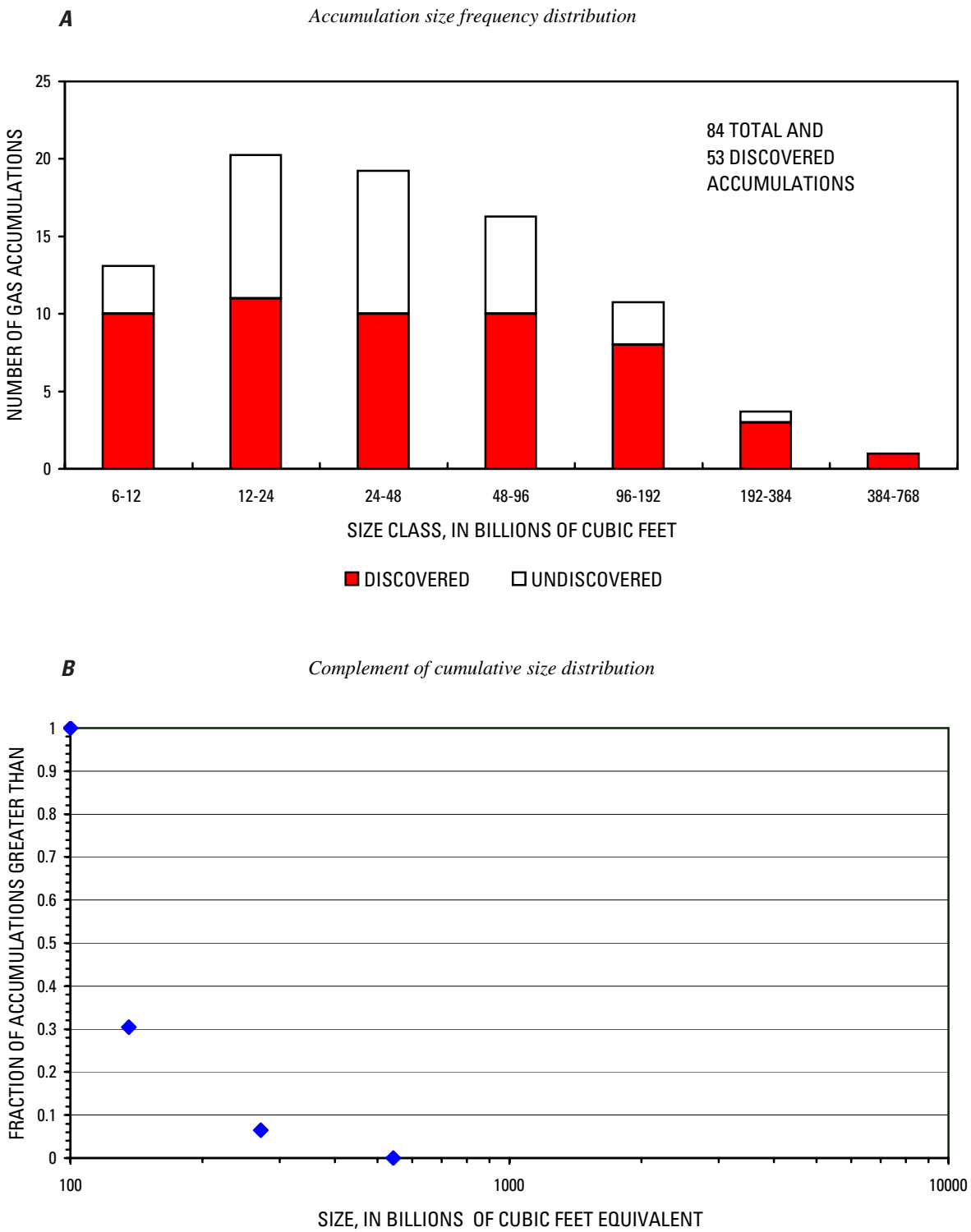

Figure 59. *A*. Size-frequency distribution of discovered and expected undiscovered gas accumulations where the minimum accumulation size is 6 billion cubic feet of gas equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 100 billion cubic feet of gas equivalent.

Gas: Play 4912–Smackover Salt Basins Gas and Oil; Louisiana–Mississippi Salt Basins

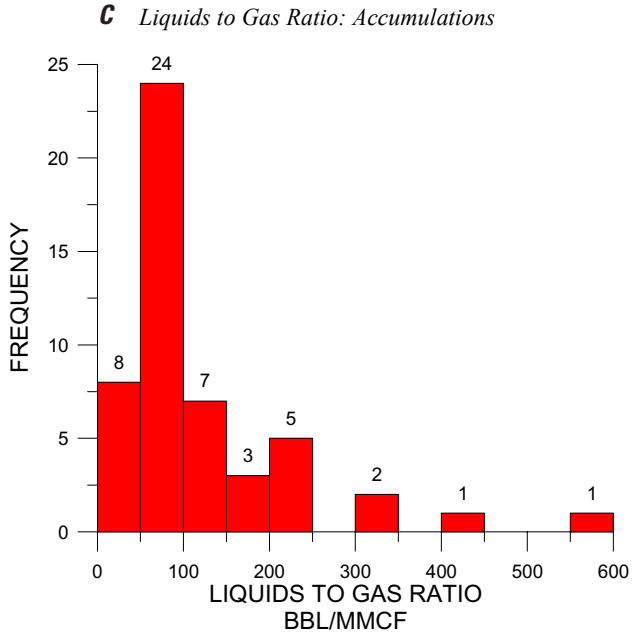

Figure 59. Continued. *C*. Histogram of liquids to gas ratios, in barrels per million cubic feet, of discovered gas accumulations.

Table 63. Numbers of discovered gas accumulations and volume of known gas recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Gas Accumulations Number	Gas Accumulations Percent of Play	Gas Volume BCF	Gas Volume Percent of Play
		By lithology				
4912	dolomite	limestone	4	7.8	121	7.5
4912	dolomite		9	17.6	323	20
4912	limestone	dolomite	9	17.6	389	24
4912	limestone		29	56.9	787	48.6
PLAY TOTAL			51	100	1,620	100
USGS Play Number	**Trap type**		**Number**	**Percent of Play**	**BCF**	**Percent of Play**
		By trap type				
4912	combination		24	47.1	902	55.7
4912	stratigraphic		1	2	35	2.2
4912	structural		22	43.1	632	39
PLAY SUBTOTAL			47	92.2	1,569	96.9

Gas: Play 4926–Hosston/Travis Peak Salt Basins Gas; Louisiana–Mississippi Salt Basins

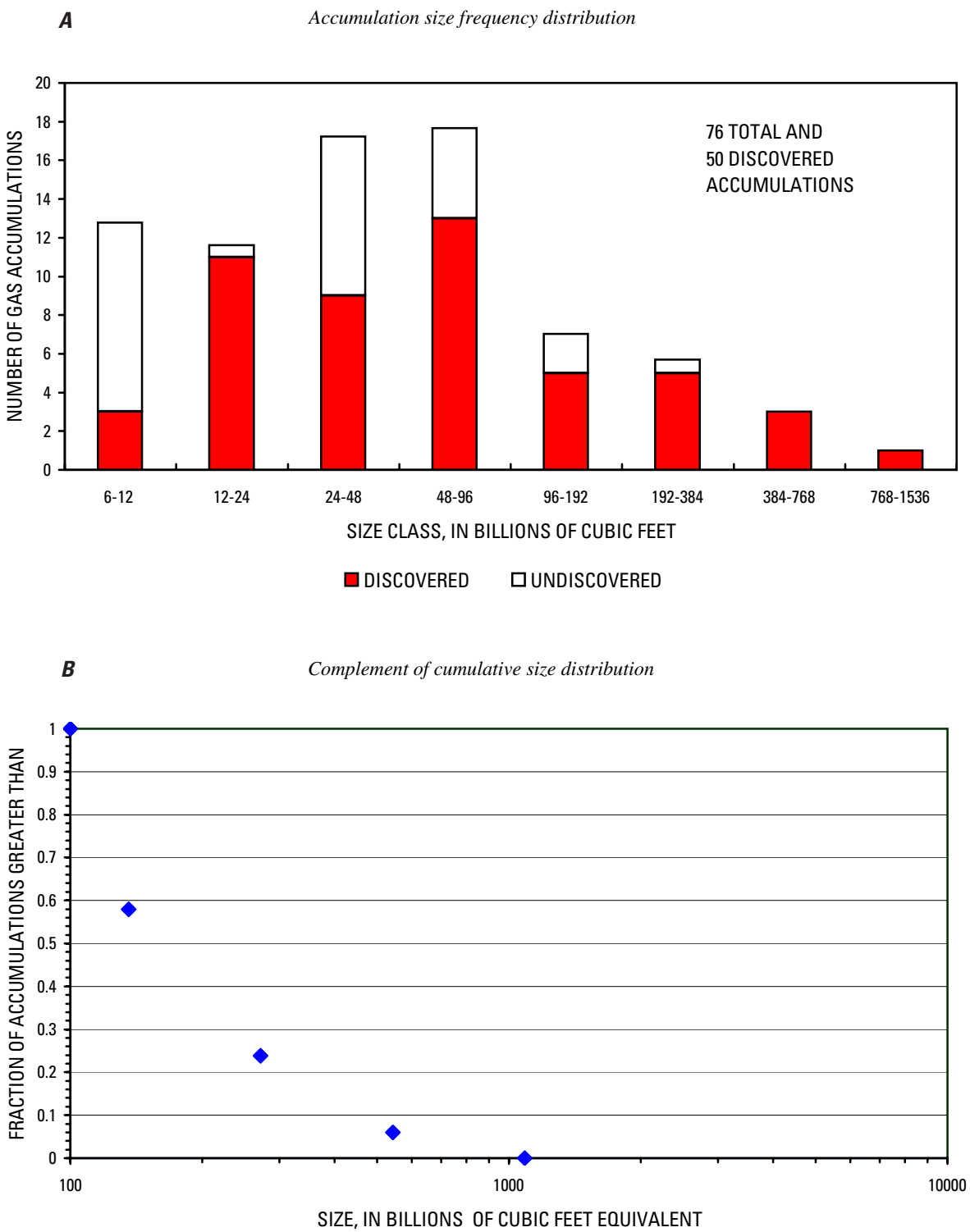

Figure 60. *A*. Size-frequency distribution of discovered and expected undiscovered gas accumulations where the minimum accumulation size is 6 billion cubic feet of gas equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 100 billion cubic feet of gas equivalent.

Gas: Play 4926–Hosston/Travis Peak Salt Basins Gas; Louisiana–Mississippi Salt Basins

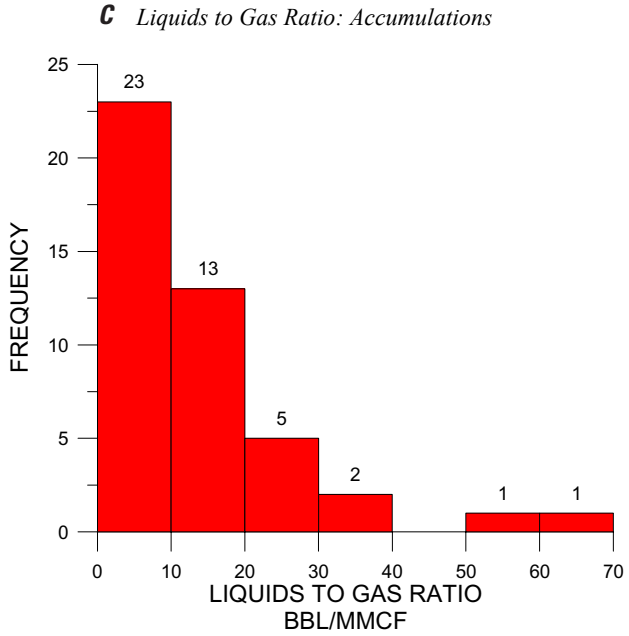

Figure 60. Continued. *C*. Histogram of liquids to gas ratios, in barrels per million cubic feet, of discovered gas accumulations.

Table 64. Numbers of discovered gas accumulations and volume of known gas recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Gas Accumulations Number	Gas Accumulations Percent of Play	Gas Volume BCF	Gas Volume Percent of Play
		By lithology				
4926	sandstone		45	100	3,362	100
PLAY TOTAL			45	100	3,362	100
USGS Play Number	**Trap type**		**Number**	**Percent of Play**	**BCF**	**Percent of Play**
		By trap type				
4926	combination		23	51.1	2,341	69.6
4926	stratigraphic		5	11.1	107	3.2
4926	structural		13	28.9	702	20.9
PLAY SUBTOTAL			41	91.1	3,150	93.7

Gas: Play 4933–Glen Rose/Rodessa Salt Basins Gas; Louisiana–Mississippi Salt Basins

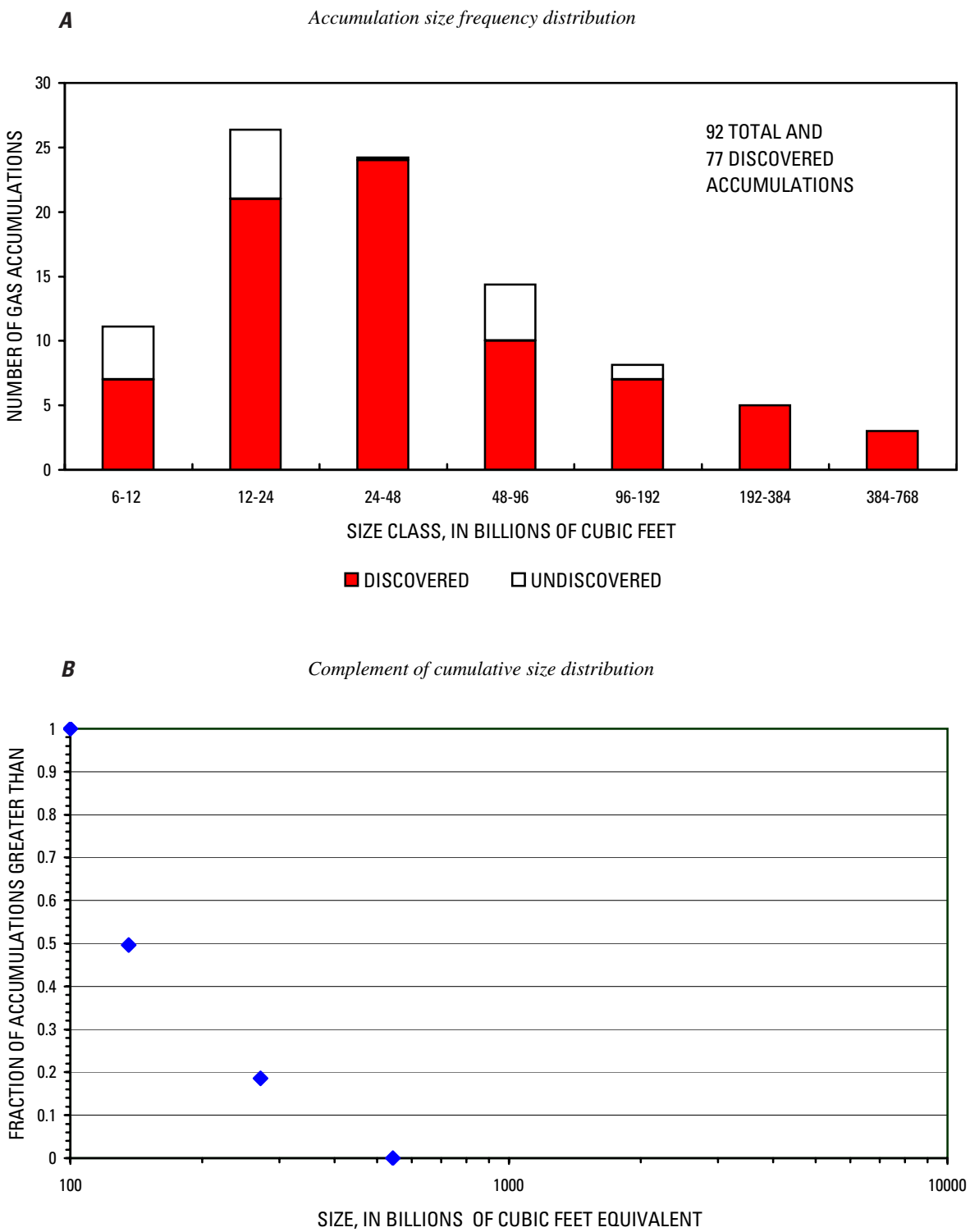

Figure 61. *A*. Size-frequency distribution of discovered and expected undiscovered gas accumulations where the minimum accumulation size is 6 billion cubic feet of gas equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 100 billion cubic feet of gas equivalent.

Gas: Play 4933–Glen Rose/Rodessa Salt Basins Gas; Louisiana–Mississippi Salt Basins

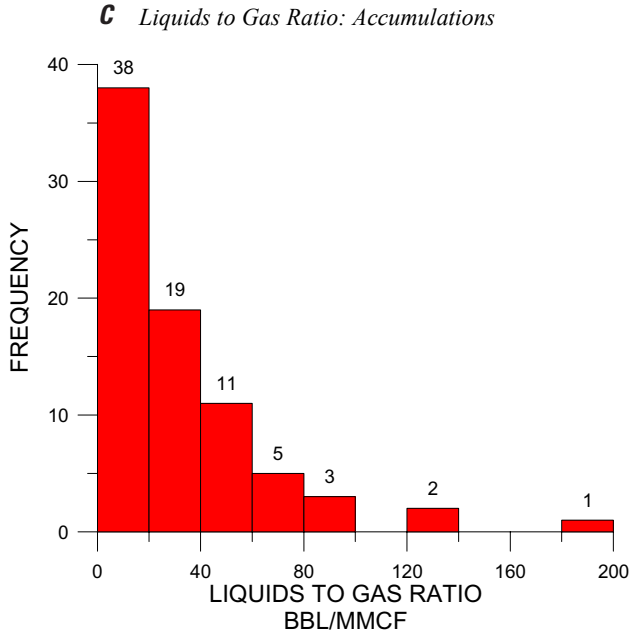

Figure 61. Continued. *C*. Histogram of liquids to gas ratios, in barrels per million cubic feet, of discovered gas accumulations.

Table 65. Numbers of discovered gas accumulations and volume of known gas recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Gas Accumulations Number	Gas Accumulations Percent of Play	Gas Volume BCF	Gas Volume Percent of Play
		By lithology				
4933	limestone		43	54.4	2,429	57.9
4933	limestone	sandstone	11	13.9	1,038	24.7
4933	limestone	shale	1	1.3	22	0.5
4933	sandstone	limestone	3	3.8	242	5.8
4933	sandstone		21	26.6	466	11.1
PLAY TOTAL			79	100	4,195	100
USGS Play Number	**Trap type**		**Number**	**Percent of Play**	**BCF**	**Percent of Play**
		By trap type				
4933	combination		46	58.2	3,569	85.1
4933	stratigraphic		11	13.9	158	3.8
4933	structural		18	22.8	410	9.8
PLAY SUBTOTAL			75	94.9	4,137	98.7

Gas: Play 5816–Morrow Sandstone Gas and Oil Stratigraphic; Anadarko Basin

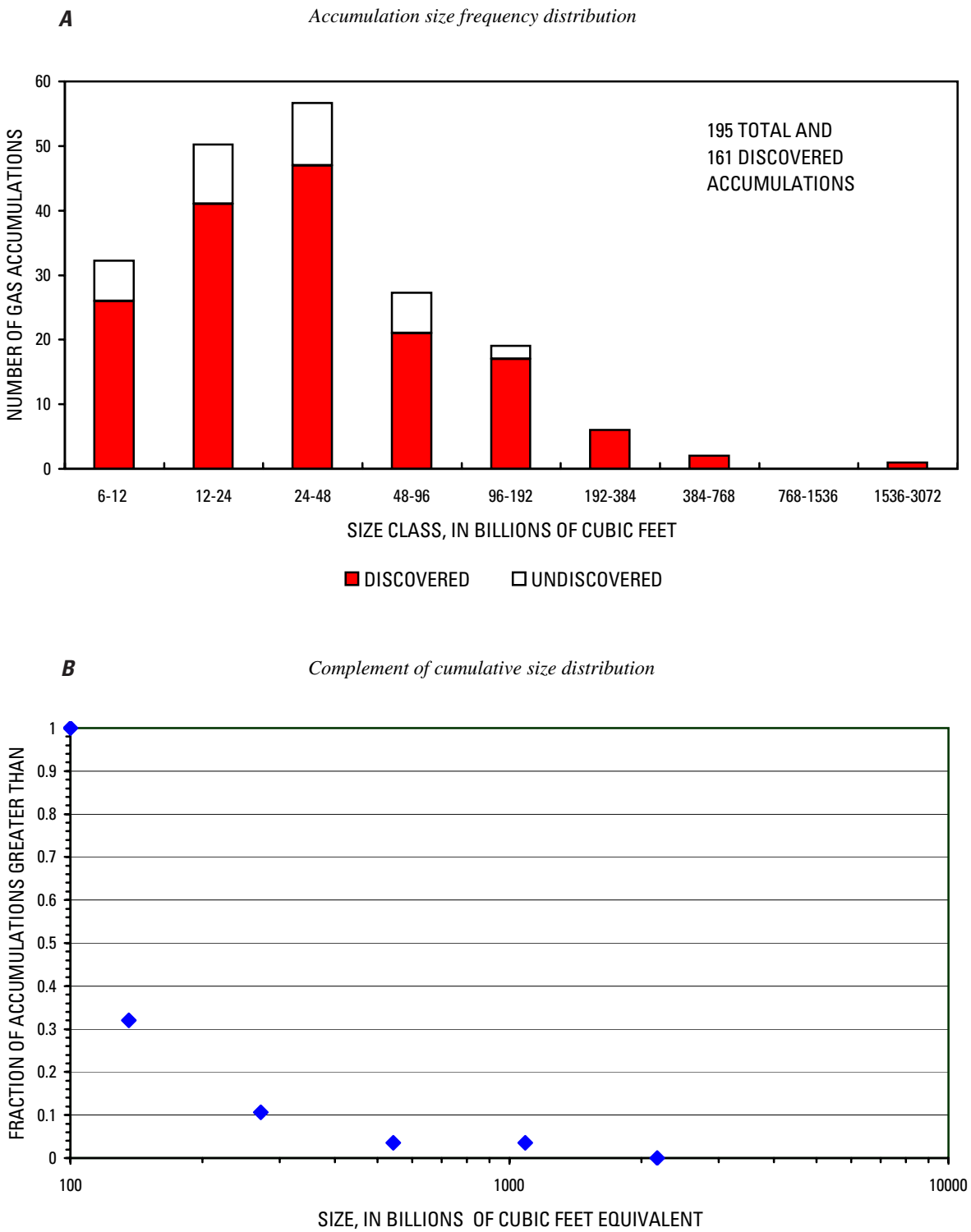

Figure 62. *A*. Size-frequency distribution of discovered and expected undiscovered gas accumulations where the minimum accumulation size is 6 billion cubic feet of gas equivalent. *B*. Complement of the cumulative size–frequency distribution of accumulations of at least 100 billion cubic feet of gas equivalent.

Gas: Play 5816–Morrow Sandstone Gas and Oil Stratigraphic; Anadarko Basin

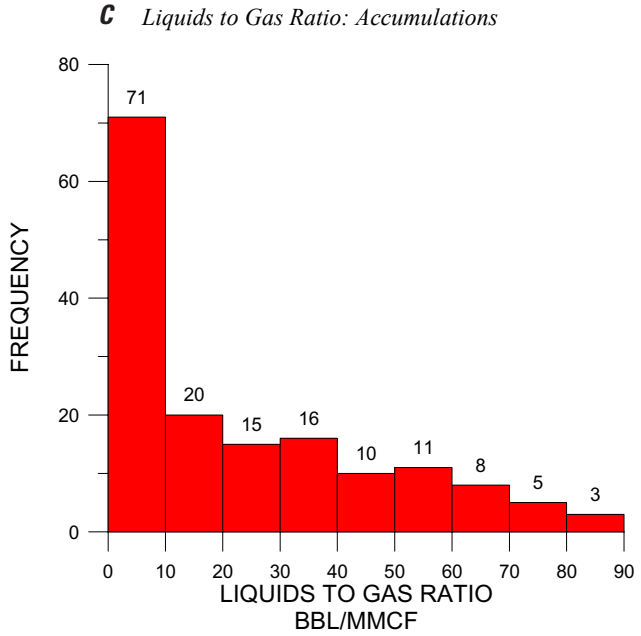

Figure 62. Continued. *C*. Histogram of liquids to gas ratios, in barrels per million cubic feet, of discovered gas accumulations.

Table 66. Numbers of discovered gas accumulations and volume of known gas recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Gas Accumulations Number	Gas Accumulations Percent of Play	Gas Volume BCF	Gas Volume Percent of Play
		By lithology				
5816	chert	conglomerate	1	0.6	84	1.2
5816	sandstone		157	98.7	6,791	97.8
5816	sandstone	shale	1	0.6	68	1
PLAY TOTAL			159	100	6,943	100
USGS Play Number	**Trap type**		**Number**	**Percent of Play**	**BCF**	**Percent of Play**
		By trap type				
5816	combination		41	25.8	3,675	52.9
5816	stratigraphic		85	53.5	2,790	40.2
5816	structural		2	1.3	13	0.2
PLAY SUBTOTAL			128	80.6	6,479	93.3

Gas: Play 6307–Northern Niagaran Reef; Michigan Basin

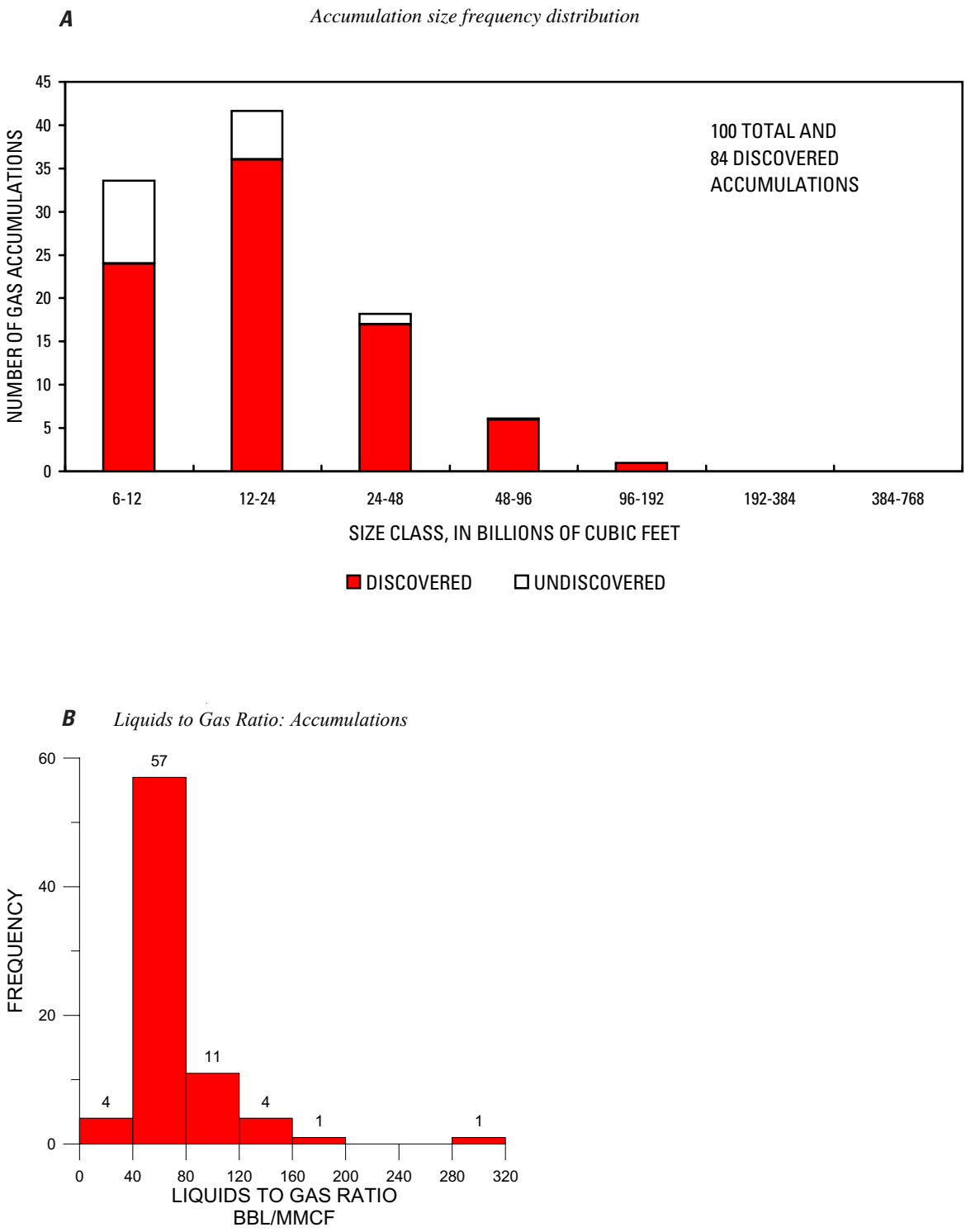

Figure 63. *A*. Size-frequency distribution of discovered and expected undiscovered gas accumulations where the minimum accumulation size is 6 billion cubic feet of gas equivalent. *B*. Histogram of liquids to gas ratios, in barrels per million cubic feet, of discovered gas accumulations. Since all accumulations are less than 100 billion cubic feet of gas equivalent, there is no graph showing the complement of the cumulative size–frequency distribution of accumulations of at least 100 billion cubic feet of gas equivalent.

Gas: Play 6307–Northern Niagaran Reef; Michigan Basin

Table 67. Numbers of discovered gas accumulations and volume of known gas recovery by principal and secondary lithology, and by major trap type. [Data are from NRG Associates (2001)]

USGS Play Number	Primary Lithology	Secondary Lithology	Gas Accumulations Number	Gas Accumulations Percent of Play	Gas Volume BCF	Gas Volume Percent of Play
		By lithology				
6307	dolomite		76	97.4	837	98.7
6307	limestone	dolomite	1	1.3	5	0.6
6307	limestone		1	1.3	6	0.7
PLAY TOTAL			78	100	848	100

USGS Play Number	Trap type	Number	Percent of Play	BCF	Percent of Play
	By trap type				
6307	stratigraphic	78	100	848	100
PLAY TOTAL		78	100	848	100

Appendix 1.

Table 1-1. Size classes and total numbers of oil accumulations for selected plays, where accumulations contain at least 1 million barrels of oil. Total accumulations are the sum of discovered and expected undiscovered as assessed in the U.S. Geological Survey's 1995 National Assessment (Gautier and others, 1996).

USGS play number	Number and size classes (in millions of barrels of oil equivalent) of plays with at least 50 total oil accumulations												
	Total	1-2	2-4	4-8	8-16	16-32	32-64	64-128	128-256	256-512	512-1024	1024-2048	2048-4096
1302	76.3	3.5	15.3	13.2	16.4	9.8	9.0	5.0	2.0	1.0	0	1.0	0
3101	161.9	29.4	45.8	40.9	16.5	14.2	8.6	3.3	3.1	0	0	0	0
3102	108.0	35.2	33.8	24.4	8.7	5.0	0	1.0	0	0	0	0	0
3103	78.9	21.0	36.6	11.9	8.5	0	0	1.0	0	0	0	0	0
3302	52.5	5.1	11.9	11.4	10.1	5.0	5.0	3.0	0	0	1.0	0	0
3304	152.4	12.9	48.1	46.9	28.7	14.9	0	1.0	0	0	0	0	0
3402	90.4	15.8	15.3	13.3	11.8	12.3	7.0	6.0	6.0	3.0	0	0	0
3905	258.1	67.0	107.9	49.1	24.0	9.1	0	1.0	0	0	0	0	0
4402	273.1	47.1	49.8	58.6	36.1	34.9	27.7	10.1	6.0	3.0	0	0	0
4403	171.3	35.8	48.1	34.1	27.0	12.5	9.8	3.0	1.0	0	0	0	0
4405	73.1	11.1	29.1	10.4	5.5	6.0	2.0	5.0	1.0	1.0	1.0	0	1.0
4406	320.5	71.7	79.7	71.3	42.7	22.7	19.8	6.3	6.4	0	0	0	0
4407	70.7	7.6	21.6	16.6	10.8	10.7	3.5	0	0	0	0	0	0
4410	312.2	43.8	58.5	73.5	38.1	37.9	13.3	15.0	13.0	6.0	8.0	3.0	2.0
4411	425.4	83.5	109.4	86.1	54.5	39.0	23.1	12.9	6.0	6.0	3.0	0	2.0
4412	134.2	19.1	29.7	31.2	30.1	16.0	7.7	0.4	0	0	0	0	0
4502	74.1	24.8	34.3	9.5	4.4	1.0	0	0	0	0	0	0	0
4504	118.1	38.0	44.3	15.0	9.5	8.4	2.0	1.0	0	0	0	0	0
4505	349.3	103.8	112.8	69.4	33.3	20	4.0	5.0	0	1.0	0	0	0
4506	149.3	52.7	52.0	23.1	16.1	4.4	1.0	0	0	0	0	0	0
4701	59.2	9.7	8.4	8.5	6.3	7.8	8.4	4.1	0	2.0	3.0	1.0	0
4722	84.7	23.8	23.3	17.3	5.5	11.2	2.5	1.2	0	0	0	0	0
4726	120.3	34.7	41.4	23.6	12.7	5.0	1.0	1.0	1.0	0	0	0	0
4728	121.4	32.1	34.2	27.9	14.3	5.0	4.0	3.0	1.0	0	0	0	0
4733	227.6	55.9	48.6	46.7	31.9	12.6	16.0	9.0	5.0	0	1.0	1.0	0
4735	137.3	27.2	32.9	33.1	20.5	7.6	5.0	5.0	4.0	2.0	0	0	0
4912	78.5	10.2	23.5	12.6	15.7	7.3	5.4	2.0	1.0	1.0	0	0	0
4932	100.7	25.2	30.2	13.7	13.9	10.7	4.1	1.0	2.0	0	0	0	0
4934	88.7	17.8	31.7	21.5	4.4	6.3	4.0	1.0	1.0	1.0	0	0	0
4937	102.1	17.0	28.2	23.4	17.3	5.2	2.0	1.0	5.0	1.0	1.0	1.0	0
4945	172.8	42.6	64.6	37.6	21.0	4.0	3.0	0	0	0	0	0	0
5305	72.3	22.9	31.2	10.5	6.7	1.1	0	0	0	0	0	0	0
5816	66.0	5.0	20.5	16.2	15.8	7.3	0.3	1.0	0	0	0	0	0
6005	56.3	13.7	23.0	9.9	3.2	3.5	2.1	1.0	0	0	0	0	0
6301	83.1	21.9	18.2	14.6	14.3	8.1	6.1	0	0	0	0	0	0
6307	203.1	18.7	88.2	71.2	22.1	3.0	0	0	0	0	0	0	0

Table 1-2. Size classes and total numbers of gas accumulations for selected plays, where accumulations contain at least 6 billion cubic feet of gas. Total accumulations are the sum of discovered and expected undiscovered as assessed in the U.S. Geological Survey's 1995 National Assessment (Gautier and others, 1996).

USGS play number	Number and size classes (in billions of cubic feet of gas equivalent) of plays with at least 50 total gas accumulations												
	Total	6-12	12-24	24-48	48-96	96-	192-	384-768	768-1536	1536-3072	3072-6144	6144-12,288	12,288-24,576
903	83.0	12.2	14.8	21.8	16.2	8.6	5.4	3.0	0	0	1.0	0	0
4401	134.1	15.5	16.6	31.7	18.1	17.3	16.6	9.2	6.2	1.0	1.0	1.0	0
4404	192.4	24.5	44.1	44.5	44.1	20.8	10.3	4.0	0	0	0	0	0
4406	67.5	12.8	18.6	18.3	10.3	4.5	1.0	0	0	2.0	0	0	0
4407	108.5	19.2	25.2	20.7	18.6	11.2	6.5	4.0	1.0	2.0	0	0	0
4410	59.0	20	10.7	13.9	7.3	5.1	0	1.0	1.0	0	0	0	0
4504	150.2	47.6	38.2	41.5	15.8	5.1	0	1.0	0	0	1.0	0	0
4718	120.2	20.5	23.2	27.1	14.6	17.9	7.4	3.5	3.0	2.0	1.0	0	0
4719	73.8	23.8	17.7	19.0	9.3	2.0	1.0	0	1.0	0	0	0	0
4722	327.2	70.3	81.3	75.0	48.6	30.7	8.8	10.3	2.3	0	0	0	0
4723	115.8	19.4	28.7	23.9	20.1	7.7	8.7	5.4	1.0	1.0	0	0	0
4726	114.5	35.4	38.4	19.2	13.5	3.7	3.3	1.0	0	0	0	0	0
4727	98.3	18.9	26.5	17.8	12.8	13.6	6.0	1.9	0.8	0	0	0	0
4731	121.9	23.2	22.7	24.4	21.5	15.8	6.4	6.0	0	1.0	1.0	0	0
4732	80	13.1	26.6	20.4	12.1	4.8	1.0	2.0	0	0	0	0	0
4733	355.8	98.6	84.8	70.9	47.3	23.2	15.0	8.0	4.0	3.0	0	1.0	0
4734	87.5	38.9	25.6	11.9	5.1	4.0	2.0	0	0	0	0	0	0
4735	139.1	40.2	40.5	23.7	18.2	8.0	4.5	2.0	1.0	1.0	0	0	0
4736	105.5	29.5	26.5	16.2	21.7	7.2	2.5	1.0	0	1.0	0	0	0
4739	92.7	30.5	28.8	20.3	8.0	2.0	3.0	0	0	0	0	0	0
4912	84.3	13.1	20.3	19.2	16.3	10.8	3.7	1.0	0	0	0	0	0
4926	76.0	12.8	11.6	17.2	17.7	7.0	5.7	3.0	1.0	0	0	0	0
4933	92.2	11.1	26.4	24.2	14.4	8.1	5.0	3.0	0	0	0	0	0
5816	194.5	32.2	50.3	56.7	27.3	19.1	6.0	2.0	0	1.0	0	0	0
6307	100.5	33.6	41.6	18.2	6.1	1.0	0	0	0	0	0	0	0