

Chapter RS

ASSESSMENT RESULTS

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ABSTRACT

We present detailed results for in-place and technically recoverable oil, non-associated gas, associated dissolved gas, and natural gas liquids assessed in each of the 10 plays of the 1002 area including the distributions of these resources at their means. Play results are aggregated to (1) the entire assessment area, which includes Federal and non-Federal lands, (2) the 1002 area, which includes only Federal lands, (3) the plays within the undeformed 1002 area, and (4) the plays within the deformed 1002 area. Aggregate results include the mean estimates of all commodities and estimates of uncertainty for oil and non-associated gas. We also present the input specifications -- including hydrocarbon volume parameters, accumulation characteristics, and risking information -- used to generate the play results.

INTRODUCTION

In this chapter we tabulate the computational results of the assessment. The computational process is captured schematically in [Fig. AO16](#). The forms represented in the upper left of [Fig. AO16](#) contain the input for the computations. The arrows of [Fig. AO16](#) represent portions of the computational process. The boxes of [Fig. AO16](#) showing volumes of recoverable hydrocarbons represent the results of computations which are tabulated in this chapter. The box in the lower right of [Fig. AO16](#) represents an economic analysis; it is not discussed in this chapter.

The rationales for the input values are given in descriptions of the plays in Chaps. P1 through P10. The computational methodology is described by Schuenemeyer in Chap. ME with terminology defined by Charpentier in Chap. DF. Further discussion of the results, as well as tabular and graphical summaries, can be found in Chap. AO and the Executive Summary. Attansi (Chap. EA) uses the results from this chapter as the basis for an economic analysis of potential oil and gas recovery from the 1002 area.

The entire assessment area includes the State of Alaska waters within the three-mile limit, the Native lands, and Federal lands, as shown in [Fig. AO2](#). The 1002 area includes only the Federal lands, and excludes the State waters and Native lands. Results are also aggregated into two subdivisions of the 1002 area: the undeformed area and the deformed area ([Fig. AO2](#)).

PLAY RESULTS

Detailed descriptions of the plays are presented in **Chap. P1** (the Topset play) through Chap. P10 (the Niguanak-Aurora play). The estimates of the oil and gas resources for these plays are presented in **Tables RS1** through RS11. As described in Chap. ME, the Niguanak-Aurora was partitioned into two scenarios and the results combined. We present the unweighted results separately in Tables RS10 and RS11. Five tables, with suffixes labeled a through e, are used to describe the parameters, constants, and results for each play. Tables with suffixes a and b contain input specifications. Tables with suffixes c, d, and e contain play results.

A play area can encompass Federal lands, Native lands, and State waters, as shown in the maps and texts of **Figures AO6** through AO15. (Of the ten plays, only the Ellesmerian Thrust-Belt play (**Figure AO14**) contains no Native lands or State waters, thus all of its area lies within the 1002 area.) Results given in portions c, d, and e of Tables RS1 through RS11 are for the entire area of each play.

We use the Thomson play (Tables RS4a-RS4e) as an example, because it contains accumulations of both oil and non-associated gas. Schenk and Houseknecht (**Chap. P4**) describe the play and present the reasoning behind the input specifications.

Input Specifications

Table RS4a. **Table RS4a** shows the distributions of hydrocarbon volume parameters, oil accumulation characteristics, and geographic allocation of resources used in the simulation program (Chap. ME). The trap depth (in thousands of feet below sea level) was sampled. To this depth was added the average surface elevation. The resultant subsurface depth was used in the computation of accumulation characteristics and subsequent economic analyses. The gas characteristics, which are also a function of depth, for this and the other plays are given in **Table RS12**. These accumulation characteristics and the hydrocarbon volume parameters were combined to model volumes of accumulations of oil and gas using the Monte Carlo simulation approach described in Chap. ME. The distributions of the six hydrocarbon volume parameters for the Thomson play are shown in blue in **Figs. RS1a** and RS1b. The distributions for the other plays are also

presented. Information in the allocation section of Table RS4a was used to partition and aggregate results.

Table RS4b. Table RS4b gives the minimum reservoir size, the number-of-prospects distribution, and the risking values used to compute unconditional oil and gas resource results for the Thomson play. The number-of-prospects distribution is of prospects at least as large as the minimum reservoir size. However, the occurrence of these prospects is conditional upon favorable play attributes.

Play Results

Table RS4c. Means and standard deviations for in-place resources, technically recoverable resources, and number of deposits are given in Table RS4c for oil, non-associated gas, and the co-products. For example, the mean total volume of technically recoverable oil in the Thomson play was estimated to be 362.30 MMBO with a standard deviation of 441.22 MMBO. Formulas for the computation of co-products are given and discussed in Chap. ME.

Table RS4d. The distributions of these resources by accumulation-size class for the mean values of Table RS4c are given in Table RS4d. These distributions are presented in \log_2 size classes. Histograms of the number of deposits and technically recoverable oil for the Thomson play are shown in Fig. RS2 along with histograms for other plays.

Table RS4e. The distribution of the number of deposits and volume of technically recoverable oil by accumulation-size class for the Thomson play at the 95th, 50th and 5th fractiles is given in Table RS4e. There is no uniquely defined size-class distribution at a fractile. However, in order to help characterize technically recoverable oil at these fractiles, we have chosen to estimate a distribution as a mean of deposits in simulation runs near the fractile (fractile +/- 10 observations). A discussion of this procedure is given in Chap. ME. It should also be noted that, for the Thomson play, the values in the 95th fractile distribution are all zero. This occurred because assessors thought that there were very few prospects greater than the minimum reservoir size and the probability of a favorable prospect was only 0.225 (Table RS4b). Thus, for the Thomson play, the first non-zero value of technically recoverable oil occurs at the 85th fractile.

The distributions and other summary statistics presented in Tables RS4c, RS4d, RS4e, and in corresponding tables for other plays are unconditional results, the probabilities of favorable play and prospect having been applied.

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AGGREGATE RESULTS

Table RS14. The results from individual plays were combined at four levels of aggregation stated in the introduction, namely the entire assessment area, the 1002 area, the undeformed area within the 1002 area, and the deformed area within the 1002 area. The percentages of hydrocarbon resources in the 1002 area are given in the allocation section of the “a” tables. For example, in the Thomson play it is 68 percent ([Table RS4a](#)). A summary of the aggregate resource estimates is presented in [Table RS14](#). The methodology used to obtain these results is discussed in Chap. ME. Uncertainty estimates were not computed for the co-products because they would be derived from oil and (or) non-associated gas and would be only an approximation to the true uncertainty.

The distributions of in-place and technically recoverable oil and non-associated gas for the four levels of aggregation are shown in [Figs. RS3-RS6](#). Each of these distributions represents realizations of a sum, across plays, of the mean oil or gas within a play. In general, the aggregate distributions of oil tend to be more symmetric than those of non-associated gas because more plays contained oil than gas. Thus, each element in the aggregate distributions of oil was based upon more observations than those of gas. The central limit theorem of statistics states that under certain conditions the distribution of sums becomes normal. For example, the 1002 distribution of technically recoverable oil ([Fig. RS4](#)) is almost symmetric, which is a reflection of the aggregation of oil from 9 of the 10 plays.

SUMMARY

These results have been discussed and summarized in Chaps. AO and the Executive Summary of this publication. In addition to the tables and figures of this chapter, the reader is referred to [Table OA3](#) for a summary tabulation of in-place and technically recoverable resources aggregated for four areas,

to [Fig. 5](#) of the Executive Summary and [Fig. AO19](#) for histograms of the number of accumulations and volume of technically recoverable oil grouped by accumulation-size class, to [Fig. AO18](#) for pie charts of technically recoverable oil by play, and to [Fig. AO17](#) for a graph of oil-volume probabilities for the 1002 area.

Table RS1a. Topset play—Volumetric parameters and oil accumulation characteristics.

[ft, feet; MMBO, millions of barrels of oil; rb/stb, reservoir barrels per stock tank barrel; bbl, barrel; STP, standard temperature and pressure—60°F and 1 atmosphere pressure]

HYDROCARBON VOLUME PARAMETERS							
Attributes	Probability of more than (fractiles)						Maximum
	100	95	75	50	25	5	
Net reservoir thickness (ft)	50	63	100	150	250	425	500
Area of closure (thousands of acres).....	0.5	1	1.5	2	5	10	20
Porosity (percent)	15	18	22	25	28	33	40
Water saturation (percent).....	33.3	27.8	22.7	20.0	17.9	15.2	12.5
Trap fill (percent).....	30	40	55	70	83	95	100
Trap depth (thousands of feet below sea level)	1	2.5	4	5	6	8	10
Average surface elevation (ft).....							100
Correlation between porosity and water saturation.....							-1
OIL ACCUMULATION CHARACTERISTICS							
Oil recovery factor (percent)							40
Type of reservoir drive (oil):							Water, depletion
FVF (Formation volume factor, in rb/stb)							
FVF = 1, for depth 2,170 ft							
FVF = $0.8913 + (5.01 \times 10^{-2} \times \text{Depth in thousands of feet})$, for 2,170 ft < depth < 12,150 ft							
FVF = 1.5, for depth 12,150 ft							
GOR (Associated-gas-to-oil ratio, in ft ³ /bbl at STP)							
$\log_{10}(\text{GOR}) = 2.092 + (0.066906 \times \text{Depth in thousands of feet})$							
NGLR (Natural-gas-liquids-to-associated-gas ratio, in bbl/million ft ³ at STP)							
$\text{NGLR} = 1 \times 10^6 / (5.36 \times 10^5 \times \exp(-0.254 \times \text{Depth in thousands of feet}))$							
Oil quality parameters							Associated gas quality parameters
API gravity (degrees).....							30
							CO ₂ contamination (percent).....
							5
ALLOCATION							
Play area (thousands of acres, within 3-mile boundary).....							735.8
Hydrocarbon resources in 1002 area (percent).....							70
Hydrocarbon resources in non-1002 area (percent).....							30

Table RS1b. Topset play—Numbers of prospects and probabilities for play and prospect attributes.

[MMBO, millions of barrels of oil]

Minimum reservoir size (MMBO, in place)..... 50

	Probability of more than						Maximum
	(fractiles)						
	100	95	75	50	25	5	
Number of prospects greater than the minimum size	40	49	65	80	97	116	125

PLAY ATTRIBUTES	Probability of <u>favorable C, R, or F</u>	Calculated <u>value</u>
Charge (C).....	1	
Potential reservoir facies (R).....	1	
Timely trap formation (F).....	1	
Probability that the play is favorable (C × R × F).....		1

PROSPECT ATTRIBUTES	Probability of <u>favorable c, r, or f</u>	
Charge (c).....	0.9	
Potential reservoir facies (r).....	0.6	
Timely trap formation (f).....	0.5	
Probability that a chosen prospect is favorable (c × r × f).....		0.27

FRACTION OF ACCUMULATIONS BEING OIL.....	1
Fraction of accumulations being non-associated gas (1 – Oil fraction).....	0

Table RS1c. Topset play—Mean values of in-place and technically recoverable hydrocarbons.

[Totals reported below are totals for all accumulation-size classes. MMBO, millions of barrels of oil; BCFG, billions of cubic feet of gas; NGL, natural gas liquids; MMBNGL, millions of barrels of natural gas liquids]

	Mean	Standard deviation
IN-PLACE RESOURCES		
Total volume of oil (MMBO).....	15,447.05	6,737.15
Total volume of associated-dissolved gas (BCFG).....	4,259.66	1,876.16
Total volume of non-associated gas (BCFG).....	0.00	0.00
Total volume of all gas (BCFG).....	4,259.66	1,876.16
Total volume of NGL from associated-dissolved gas (MMBNGL).....	35.33	18.07
Total volume of NGL from non-associated gas (MMBNGL).....	0.00	0.00
Total volume of all NGL (MMBNGL).....	35.33	18.07
TECHNICALLY RECOVERABLE RESOURCES		
Total volume of oil (MMBO).....	6,178.82	2,694.86
Total volume of associated-dissolved gas (BCFG).....	1,703.86	750.47
Total volume of non-associated gas (BCFG).....	0.00	0.00
Total volume of all gas (BCFG).....	1,703.86	750.47
Total volume of NGL from associated-dissolved gas (MMBNGL).....	14.13	7.23
Total volume of NGL from non-associated gas (MMBNGL).....	0.00	0.00
Total volume of all NGL (MMBNGL).....	14.13	7.23
NUMBER OF DEPOSITS		
Number of oil deposits.....	21.87	6.96
Number of non-associated gas deposits.....	0.00	0.00

Table RS1e. Topset play—Distributions of technically recoverable oil at 95th, 50th, and 5th fractiles.

[MMBO, millions of barrels of oil]

	TECHNICALLY RECOVERABLE OIL—Accumulation-size classes (MMBO)												
	0– <8	8– <16	16– <32	32– <64	64– <128	128– <256	256– <512	512– <1,024	1,024– <2,048	2,048– <4,096	4,096– <8,192	8,192– <16,384	16,384– <32,768
95th fractile													
Number of deposits.....	0.00	0.00	0.86	2.43	3.43	3.19	1.71	0.86	0.10	0.00	0.00	0.00	0.00
Total volume of oil (MMBO).....	0.00	0.00	21.73	118.57	317.96	592.19	640.31	599.55	122.11	0.00	0.00	0.00	0.00
50th fractile													
Number of deposits.....	0.00	0.00	1.43	2.86	5.52	5.95	3.48	2.19	0.71	0.05	0.00	0.00	0.00
Total volume of oil (MMBO).....	0.00	0.00	38.33	136.51	501.70	1,091.71	1,244.57	1,615.89	1,101.20	101.54	0.00	0.00	0.00
5th fractile													
Number of deposits.....	0.00	0.00	1.43	4.91	6.86	6.62	5.24	3.29	1.81	0.71	0.05	0.00	0.00
Total volume of oil (MMBO).....	0.00	0.00	38.41	228.54	628.80	1,210.74	1,900.93	2,274.17	2,701.70	1,925.10	203.47	0.00	0.00

Table RS2a. Turbidite play—Volumetric parameters and oil accumulation characteristics.

[ft, feet; MMBO, millions of barrels of oil; rb/stb, reservoir barrels per stock tank barrel; bbl, barrel; STP, standard temperature and pressure—60°F and 1 atmosphere pressure]

HYDROCARBON VOLUME PARAMETERS								
Attributes	Probability of more than (fractiles)						Maximum	
	100	95	75	50	25	5		
Net reservoir thickness (ft)	50	75	90	120	160	220	400	
Area of closure (thousands of acres).....	1	1.5	2.5	4	6.5	10	30	
Porosity (percent)	10	13	16	18	22	26	30	
Water saturation (percent).....	60.0	46.2	37.5	33.3	27.3	23.1	20.0	
Trap fill (percent).....	40	60	75	85	92	97.5	100	
Trap depth (thousands of feet below sea level)	7	8.5	10.5	12.5	14	16	18	
Average surface elevation (ft).....							100	
Correlation between porosity and water saturation.....							-1	
OIL ACCUMULATION CHARACTERISTICS								
Oil recovery factor (percent)							30	
Type of reservoir drive (oil):							Depletion	
FVF (Formation volume factor, in rb/stb)								
FVF = 1, for depth 2,170 ft								
FVF = $0.8913 + (5.01 \times 10^{-2} \times \text{Depth in thousands of feet})$, for 2,170 ft < depth < 12,150 ft								
FVF = 1.5, for depth 12,150 ft								
GOR (Associated-gas-to-oil ratio, in ft ³ /bbl at STP)								
$\log_{10}(\text{GOR}) = 2.092 + (0.066906 \times \text{Depth in thousands of feet})$								
NGLR (Natural-gas-liquids-to-associated-gas ratio, in bbl/million ft ³ at STP)								
$\text{NGLR} = 1 \times 10^6 / (5.36 \times 10^5 \times \exp(-0.254 \times \text{Depth in thousands of feet}))$								
Oil quality parameters	Associated gas quality parameters							
API gravity (degrees).....	25						CO ₂ contamination (percent).....	5
Sulfur content of oil (percent).....	1							
ALLOCATION								
Play area (thousands of acres, within 3-mile boundary).....							599.7	
Hydrocarbon resources in 1002 area (percent).....							80	
Hydrocarbon resources in non-1002 area (percent).....							20	

Table RS2b. Turbidite play—Numbers of prospects and probabilities for play and prospect attributes.

[MMBO, millions of barrels of oil]

Minimum reservoir size (MMBO, in place)..... 50

	Probability of more than						Maximum
	(fractiles)						
	100	95	75	50	25	5	
Number of prospects greater than the minimum size	25	30	45	60	75	95	100

PLAY ATTRIBUTES

	Probability of <u>favorable C, R, or F</u>	Calculated <u>value</u>
Charge (C).....	1	
Potential reservoir facies (R).....	1	
Timely trap formation (F).....	1	
Probability that the play is favorable (C × R × F).....		1

PROSPECT ATTRIBUTES

	Probability of <u>favorable c, r, or f</u>	
Charge (c).....	0.9	
Potential reservoir facies (r).....	0.4	
Timely trap formation (f).....	0.6	
Probability that a chosen prospect is favorable (c × r × f).....		0.216

FRACTION OF ACCUMULATIONS BEING OIL..... 1

Fraction of accumulations being non-associated gas (1 – Oil fraction)..... 0

Table RS2c. Turbidite play—Mean values of in-place and technically recoverable hydrocarbons.

[Totals reported below are totals for all accumulation-size classes. MMBO, millions of barrels of oil; BCFG, billions of cubic feet of gas; NGL, natural gas liquids; MMBNGL, millions of barrels of natural gas liquids]

	Mean	Standard deviation
IN-PLACE RESOURCES		
Total volume of oil (MMBO).....	5,328.05	2,726.00
Total volume of associated-dissolved gas (BCFG).....	4,665.20	2,478.55
Total volume of non-associated gas (BCFG).....	0.00	0.00
Total volume of all gas (BCFG).....	4,665.20	2,478.55
Total volume of NGL from associated-dissolved gas (MMBNGL).....	272.50	170.05
Total volume of NGL from non-associated gas (MMBNGL).....	0.00	0.00
Total volume of all NGL (MMBNGL).....	272.50	170.05
TECHNICALLY RECOVERABLE RESOURCES		
Total volume of oil (MMBO).....	1,598.41	817.80
Total volume of associated-dissolved gas (BCFG).....	1,399.56	743.56
Total volume of non-associated gas (BCFG).....	0.00	0.00
Total volume of all gas (BCFG).....	1,399.56	743.56
Total volume of NGL from associated-dissolved gas (MMBNGL).....	81.75	51.01
Total volume of NGL from non-associated gas (MMBNGL).....	0.00	0.00
Total volume of all NGL (MMBNGL).....	81.75	51.01
NUMBER OF DEPOSITS		
Number of oil deposits.....	13.17	5.37
Number of non-associated gas deposits.....	0.00	0.00

Table RS2e. Turbidite play—Distributions of technically recoverable oil at 95th, 50th, and 5th fractiles.

[MMBO, millions of barrels of oil]

	TECHNICALLY RECOVERABLE OIL—Accumulation-size classes (MMBO)												
	0– <8	8– <16	16– <32	32– <64	64– <128	128– <256	256– <512	512– <1,024	1,024– <2,048	2,048– <4,096	4,096– <8,192	8,192– <16,384	16,384– <32,768
95th fractile													
Number of deposits.....	0.00	0.10	1.10	1.76	2.38	0.71	0.10	0.00	0.00	0.00	0.00	0.00	0.00
Total volume of oil (MMBO).....	0.00	1.47	26.68	84.05	227.61	124.13	28.87	0.00	0.00	0.00	0.00	0.00	0.00
50th fractile													
Number of deposits.....	0.00	0.00	1.48	3.86	4.19	2.67	1.00	0.10	0.00	0.00	0.00	0.00	0.00
Total volume of oil (MMBO).....	0.00	0.00	37.47	181.37	379.21	483.44	342.09	61.41	0.00	0.00	0.00	0.00	0.00
5th fractile													
Number of deposits.....	0.00	0.05	2.62	4.81	5.86	4.62	2.10	0.86	0.14	0.00	0.00	0.00	0.00
Total volume of oil (MMBO).....	0.00	0.74	67.42	221.69	548.27	811.41	702.36	585.40	173.89	0.00	0.00	0.00	0.00

Table RS3a. Wedge play—Volumetric parameters and oil accumulation characteristics.

[ft, feet; MMBO, millions of barrels of oil; rb/stb, reservoir barrels per stock tank barrel; bbl, barrel; STP, standard temperature and pressure—60°F and 1 atmosphere pressure]

HYDROCARBON VOLUME PARAMETERS							
Attributes	Probability of more than (fractiles)						Maximum
	100	95	75	50	25	5	
Net reservoir thickness (ft)	50	65	80	100	150	220	400
Area of closure (thousands of acres).....	1.5	3	4	5	8	15	30
Porosity (percent)	10	13	16	18	22	26	30
Water saturation (percent).....	40.0	30.8	25.0	22.2	18.2	15.4	13.3
Trap fill (percent).....	40	60	75	85	92	97.5	100
Trap depth (thousands of feet below sea level)	5	7	8	9	10	12	14
Average surface elevation (ft).....							100
Correlation between porosity and water saturation.....							-1
OIL ACCUMULATION CHARACTERISTICS							
Oil recovery factor (percent)							30
Type of reservoir drive (oil):							Depletion
FVF (Formation volume factor, in rb/stb)							
FVF = 1, for depth 2,170 ft							
FVF = $0.8913 + (5.01 \times 10^{-2} \times \text{Depth in thousands of feet})$, for 2,170 ft < depth < 12,150 ft							
FVF = 1.5, for depth 12,150 ft							
GOR (Associated-gas-to-oil ratio, in ft ³ /bbl at STP)							
log ₁₀ (GOR) = $2.092 + (0.066906 \times \text{Depth in thousands of feet})$							
NGLR (Natural-gas-liquids-to-associated-gas ratio, in bbl/million ft ³ at STP)							
NGLR = $1 \times 10^6 / (5.36 \times 10^5 \times \exp(-0.254 \times \text{Depth in thousands of feet}))$							
Oil quality parameters	Associated gas quality parameters						
API gravity (degrees).....	25	CO ₂ contamination (percent).....					5
Sulfur content of oil (percent).....	1						
ALLOCATION							
Play area (thousands of acres, within 3-mile boundary).....							384.669
Hydrocarbon resources in 1002 area (percent).....							87
Hydrocarbon resources in non-1002 area (percent).....							13

Table RS3b. Wedge play—Numbers of prospects and probabilities for play and prospect attributes.

[MMBO, millions of barrels of oil]

Minimum reservoir size (MMBO, in place)..... 50

	Probability of more than						
	(fractiles)						
	100	95	75	50	25	5	Maximum
Number of prospects greater than the minimum size	10	12	14	15	19	25	35

PLAY ATTRIBUTES	Probability of <u>favorable C, R, or F</u>	Calculated <u>value</u>
Charge (C).....	1	
Potential reservoir facies (R).....	0.9	
Timely trap formation (F).....	0.8	
Probability that the play is favorable (C × R × F).....		0.72

PROSPECT ATTRIBUTES	Probability of <u>favorable c, r, or f</u>	
Charge (c).....	0.9	
Potential reservoir facies (r).....	0.5	
Timely trap formation (f).....	0.5	
Probability that a chosen prospect is favorable (c × r × f).....		0.225

FRACTION OF ACCUMULATIONS BEING OIL.....	1
Fraction of accumulations being non-associated gas (1 – Oil fraction).....	0

Table RS3c. Wedge play—Mean values of in-place and technically recoverable hydrocarbons.

[Totals reported below are totals for all accumulation-size classes. MMBO, millions of barrels of oil; BCFG, billions of cubic feet of gas; NGL, natural gas liquids; MMBNGL, millions of barrels of natural gas liquids]

	Mean	Standard deviation
IN-PLACE RESOURCES		
Total volume of oil (MMBO).....	1,677.69	1,816.38
Total volume of associated-dissolved gas (BCFG).....	864.32	944.93
Total volume of non-associated gas (BCFG).....	0.00	0.00
Total volume of all gas (BCFG).....	864.32	944.93
Total volume of NGL from associated-dissolved gas (MMBNGL).....	19.94	25.31
Total volume of NGL from non-associated gas (MMBNGL).....	0.00	0.00
Total volume of all NGL (MMBNGL).....	19.94	25.31
TECHNICALLY RECOVERABLE RESOURCES		
Total volume of oil (MMBO).....	503.31	544.91
Total volume of associated-dissolved gas (BCFG).....	259.30	283.48
Total volume of non-associated gas (BCFG).....	0.00	0.00
Total volume of all gas (BCFG).....	259.30	283.48
Total volume of NGL from associated-dissolved gas (MMBNGL).....	5.98	7.59
Total volume of NGL from non-associated gas (MMBNGL).....	0.00	0.00
Total volume of all NGL (MMBNGL).....	5.98	7.59
NUMBER OF DEPOSITS		
Number of oil deposits.....	2.75	2.42
Number of non-associated gas deposits.....	0.00	0.00

Table RS3e. Wedge play—Distributions of technically recoverable oil at 95th, 50th, and 5th fractiles.

[MMBO, millions of barrels of oil]

	TECHNICALLY RECOVERABLE OIL—Accumulation-size classes (MMBO)												
	0– <8	8– <16	16– <32	32– <64	64– <128	128– <256	256– <512	512– <1,024	1,024– <2,048	2,048– <4,096	4,096– <8,192	8,192– <16,384	16,384– <32,768
95th fractile													
Number of deposits.....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total volume of oil (MMBO).....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50th fractile													
Number of deposits.....	0.00	0.00	0.10	0.48	1.24	0.95	0.19	0.00	0.00	0.00	0.00	0.00	0.00
Total volume of oil (MMBO).....	0.00	0.00	2.67	24.16	121.32	173.14	61.12	0.00	0.00	0.00	0.00	0.00	0.00
5th fractile													
Number of deposits.....	0.00	0.00	0.10	0.91	2.05	1.76	1.33	0.48	0.14	0.00	0.00	0.00	0.00
Total volume of oil (MMBO).....	0.00	0.00	2.75	44.89	190.65	328.07	456.50	352.52	180.40	0.00	0.00	0.00	0.00

Table RS4a. Thomson play—Volumetric parameters and oil accumulation characteristics.

[ft, feet; MMBO, millions of barrels of oil; rb/stb, reservoir barrels per stock tank barrel; bbl, barrel; STP, standard temperature and pressure—60°F and 1 atmosphere pressure]

HYDROCARBON VOLUME PARAMETERS							
Attributes	Probability of more than (fractiles)						Maximum
	100	95	75	50	25	5	
Net reservoir thickness (ft)	40	50	80	120	200	300	340
Area of closure (thousands of acres).....	1	1.3	2.1	2.5	5	16	22
Porosity (percent)	10	12	16	18	22	27	30
Water saturation (percent).....	60.0	50.0	37.5	33.3	27.3	22.2	20.0
Trap fill (percent).....	60	70	78	85	93	98	100
Trap depth (thousands of feet below sea level)	12	12.75	14	15	16	17.25	18
Average surface elevation (ft).....							10
Correlation between porosity and water saturation.....							-1
OIL ACCUMULATION CHARACTERISTICS							
Oil recovery factor (percent)							45
Type of reservoir drive (oil):							Depletion, gas expansion
FVF (Formation volume factor, in rb/stb)							
FVF = 1, for depth 2,170 ft							
FVF = $0.8913 + (5.01 \times 10^{-2} \times \text{Depth in thousands of feet})$, for 2,170 ft < depth < 12,150 ft							
FVF = 1.5, for depth 12,150 ft							
GOR (Associated-gas-to-oil ratio, in ft ³ /bbl at STP)							
$\log_{10}(\text{GOR}) = 2.092 + (0.066906 \times \text{Depth in thousands of feet})$							
NGLR (Natural-gas-liquids-to-associated-gas ratio, in bbl/million ft ³ at STP)							
$\text{NGLR} = 1 \times 10^6 / (5.36 \times 10^5 \times \exp(-0.254 \times \text{Depth in thousands of feet}))$							
Oil quality parameters							
API gravity (degrees).....							37
Sulfur content of oil (percent).....							0.2
ALLOCATION							
Play area (thousands of acres, within 3-mile boundary).....							138.107
Hydrocarbon resources in 1002 area (percent).....							68
Hydrocarbon resources in non-1002 area (percent).....							32

Table RS4b. Thomson play—Numbers of prospects and probabilities for play and prospect attributes.

[MMBO, millions of barrels of oil]

Minimum reservoir size (MMBO, in place)..... 50

	Probability of more than						Maximum
	(fractiles)						
	100	95	75	50	25	5	
Number of prospects greater than the minimum size	4	5	7	9	11	14	15

PLAY ATTRIBUTES

	Probability of <u>favorable C, R, or F</u>	Calculated <u>value</u>
Charge (C).....	1	
Potential reservoir facies (R).....	1	
Timely trap formation (F).....	1	
Probability that the play is favorable (C × R × F).....		1

PROSPECT ATTRIBUTES

	Probability of <u>favorable c, r, or f</u>	
Charge (c).....	0.9	
Potential reservoir facies (r).....	0.5	
Timely trap formation (f).....	0.5	
Probability that a chosen prospect is favorable (c × r × f).....		0.225

FRACTION OF ACCUMULATIONS BEING OIL..... 0.9

Fraction of accumulations being non-associated gas (1 – Oil fraction)..... 0.1

Table RS4c. Thomson play—Mean values of in-place and technically recoverable hydrocarbons.

[Totals reported below are totals for all accumulation-size classes. MMBO, millions of barrels of oil; BCFG, billions of cubic feet of gas; NGL, natural gas liquids; MMBNGL, millions of barrels of natural gas liquids]

	Mean	Standard deviation
IN-PLACE RESOURCES		
Total volume of oil (MMBO).....	805.10	980.50
Total volume of associated-dissolved gas (BCFG).....	1,026.61	1,280.14
Total volume of non-associated gas (BCFG).....	305.67	1,042.10
Total volume of all gas (BCFG).....	1,332.28	1,648.26
Total volume of NGL from associated-dissolved gas (MMBNGL).....	86.59	114.38
Total volume of NGL from non-associated gas (MMBNGL).....	24.92	88.57
Total volume of all NGL (MMBNGL).....	111.51	144.70
TECHNICALLY RECOVERABLE RESOURCES		
Total volume of oil (MMBO).....	362.30	441.22
Total volume of associated-dissolved gas (BCFG).....	461.97	576.06
Total volume of non-associated gas (BCFG).....	229.26	781.57
Total volume of all gas (BCFG).....	691.23	969.54
Total volume of NGL from associated-dissolved gas (MMBNGL).....	38.97	51.47
Total volume of NGL from non-associated gas (MMBNGL).....	18.69	66.43
Total volume of all NGL (MMBNGL).....	57.66	84.06
NUMBER OF DEPOSITS		
Number of oil deposits.....	1.85	1.33
Number of non-associated gas deposits.....	0.20	0.45

Table RS4d. Thomson play—Distributions of in-place and technically recoverable hydrocarbons.

[Totals reported below are totals within each accumulation-size class. MMBO, millions of barrels of oil; BCFG, billions of cubic feet of gas; MMBNGL, millions of barrels of natural gas liquids; NGL, natural gas liquids; fr, from. Total gas volume is sum of volume of associated-dissolved gas plus volume of non-associated gas]

	IN-PLACE OIL—Accumulation-size classes (MMBO)												
	0– <8	8– <16	16– <32	32– <64	64– <128	128– <256	256– <512	512– <1,024	1,024– <2,048	2,048– <4,096	4,096– <8,192	8,192– <16,384	16,384– <32,768
Number of oil deposits.....	0.00	0.00	0.00	0.09	0.40	0.50	0.43	0.25	0.13	0.05	0.01	0.00	0.00
Total volume of oil (MMBO).....	0.00	0.00	0.00	4.87	38.14	92.67	154.92	177.71	181.35	131.04	24.39	0.00	0.00
	IN-PLACE GAS—Accumulation-size classes (BCFG)												
	0– <48	48– <96	96– <192	192– <384	384– <768	768– <1,536	1,536– <3,072	3,072– <6,144	6,144– <12,288	12,288– <24,576	24,576– <49,152	49,152– <98,304	98,304– <196,608
Number of non-associated gas deposits.....	0.00	0.00	0.00	0.02	0.07	0.06	0.03	0.02	0.01	0.00	0.00	0.00	0.00
Volume of associated-dissolved gas (BCFG).....	0.17	14.09	61.85	135.63	203.67	230.32	222.42	135.53	22.93	0.00	0.00	0.00	0.00
Volume of non-associated gas (BCFG).....	0.00	0.00	0.00	7.44	37.86	61.60	65.63	79.19	50.82	3.14	0.00	0.00	0.00
Total gas volume (BCFG).....	0.17	14.09	61.85	143.07	241.53	291.91	288.05	214.71	73.75	3.14	0.00	0.00	0.00
	IN-PLACE NATURAL GAS LIQUIDS—Accumulation-size classes (MMBNGL)												
	0– <8	8– <16	16– <32	32– <64	64– <128	128– <256	256– <512	512– <1,024	1,024– <2,048	2,048– <4,096	4,096– <8,192	8,192– <16,384	16,384– <32,768
Volume fr associated-dissolved gas (MMBNGL).....	1.38	4.90	10.61	16.38	18.44	18.55	12.49	3.72	0.11	0.00	0.00	0.00	0.00
Volume fr non-associated gas (MMBNGL).....	0.00	0.02	0.73	3.02	4.81	5.30	5.98	3.89	1.18	0.00	0.00	0.00	0.00
Total NGL volume (MMBNGL).....	1.38	4.92	11.34	19.40	23.25	23.85	18.47	7.62	1.28	0.00	0.00	0.00	0.00
	TECHNICALLY RECOVERABLE OIL—Accumulation-size classes (MMBO)												
	0– <8	8– <16	16– <32	32– <64	64– <128	128– <256	256– <512	512– <1,024	1,024– <2,048	2,048– <4,096	4,096– <8,192	8,192– <16,384	16,384– <32,768
Number of oil deposits.....	0.00	0.00	0.13	0.43	0.50	0.40	0.23	0.11	0.04	0.00	0.00	0.00	0.00
Total volume of oil (MMBO).....	0.00	0.00	3.68	20.12	46.06	72.60	80.29	79.38	54.00	6.17	0.00	0.00	0.00
	TECHNICALLY RECOVERABLE GAS—Accumulation-size classes (BCFG)												
	0– <48	48– <96	96– <192	192– <384	384– <768	768– <1,536	1,536– <3,072	3,072– <6,144	6,144– <12,288	12,288– <24,576	24,576– <49,152	49,152– <98,304	98,304– <196,608
Number of non-associated gas deposits.....	0.00	0.00	0.00	0.05	0.07	0.04	0.03	0.01	0.00	0.00	0.00	0.00	0.00
Volume of associated-dissolved gas (BCFG).....	8.85	31.91	66.93	95.26	101.98	99.30	50.88	6.86	0.00	0.00	0.00	0.00	0.00
Volume of non-associated gas (BCFG).....	0.00	0.00	0.00	15.10	37.07	44.75	54.19	55.94	20.96	1.25	0.00	0.00	0.00
Total gas volume (BCFG).....	8.85	31.91	66.93	110.36	139.05	144.05	105.07	62.80	20.96	1.25	0.00	0.00	0.00
	TECHNICALLY RECOVERABLE NATURAL GAS LIQUIDS—Accumulation-size classes (MMBNGL)												
	0– <8	8– <16	16– <32	32– <64	64– <128	128– <256	256– <512	512– <1,024	1,024– <2,048	2,048– <4,096	4,096– <8,192	8,192– <16,384	16,384– <32,768
Volume fr associated-dissolved gas (MMBNGL).....	3.39	5.18	7.59	8.55	8.10	4.90	1.27	0.00	0.00	0.00	0.00	0.00	0.00
Volume fr non-associated gas (MMBNGL).....	0.00	0.10	1.23	2.92	3.70	4.28	4.48	1.88	0.11	0.00	0.00	0.00	0.00
Total NGL volume (MMBNGL).....	3.39	5.28	8.82	11.47	11.80	9.17	5.74	1.88	0.11	0.00	0.00	0.00	0.00

Table RS4e. Thomson play—Distributions of technically recoverable oil at 95th, 50th, and 5th fractiles.

[MMBO, millions of barrels of oil]

	TECHNICALLY RECOVERABLE OIL—Accumulation-size classes (MMBO)												
	0– <8	8– <16	16– <32	32– <64	64– <128	128– <256	256– <512	512– <1,024	1,024– <2,048	2,048– <4,096	4,096– <8,192	8,192– <16,384	16,384– <32,768
95th fractile													
Number of deposits.....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total volume of oil (MMBO).....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50th fractile													
Number of deposits.....	0.00	0.00	0.00	0.29	0.71	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total volume of oil (MMBO).....	0.00	0.00	0.00	13.28	68.43	131.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5th fractile													
Number of deposits.....	0.00	0.00	0.19	0.43	0.38	0.62	0.57	0.52	0.38	0.00	0.00	0.00	0.00
Total volume of oil (MMBO).....	0.00	0.00	5.56	20.78	38.80	112.35	225.30	428.84	436.16	0.00	0.00	0.00	0.00

Table RS5b. Kemik play—Numbers of prospects and probabilities for play and prospect attributes.

[MMBO, millions of barrels of oil]

Minimum reservoir size (MMBO, in place)..... 50

	Probability of more than						
	(fractiles)						
	100	95	75	50	25	5	Maximum
Number of prospects greater than the minimum size	15	18	21	24	30	37	40

PLAY ATTRIBUTES

	Probability of <u>favorable C, R, or F</u>	Calculated <u>value</u>
Charge (C).....	1	
Potential reservoir facies (R).....	0.3	
Timely trap formation (F).....	1	
Probability that the play is favorable (C × R × F).....		0.3

PROSPECT ATTRIBUTES

	Probability of <u>favorable c, r, or f</u>	
Charge (c).....	0.9	
Potential reservoir facies (r).....	0.2	
Timely trap formation (f).....	0.8	
Probability that a chosen prospect is favorable (c × r × f).....		0.144

FRACTION OF ACCUMULATIONS BEING OIL..... 0.9

Fraction of accumulations being non-associated gas (1 – Oil fraction)..... 0.1

Table RS5c. Kemik play—Mean values of in-place and technically recoverable hydrocarbons.

[Totals reported below are totals for all accumulation-size classes. MMBO, millions of barrels of oil; BCFG, billions of cubic feet of gas; NGL, natural gas liquids; MMBNGL, millions of barrels of natural gas liquids]

	Mean	Standard deviation
IN-PLACE RESOURCES		
Total volume of oil (MMBO).....	173.78	351.10
Total volume of associated-dissolved gas (BCFG).....	222.86	455.44
Total volume of non-associated gas (BCFG).....	82.52	318.75
Total volume of all gas (BCFG).....	305.38	626.95
Total volume of NGL from associated-dissolved gas (MMBNGL).....	18.81	39.49
Total volume of NGL from non-associated gas (MMBNGL).....	6.78	26.96
Total volume of all NGL (MMBNGL).....	25.59	53.62
TECHNICALLY RECOVERABLE RESOURCES		
Total volume of oil (MMBO).....	52.13	105.33
Total volume of associated-dissolved gas (BCFG).....	66.86	136.63
Total volume of non-associated gas (BCFG).....	61.89	239.06
Total volume of all gas (BCFG).....	128.75	307.78
Total volume of NGL from associated-dissolved gas (MMBNGL).....	5.64	11.85
Total volume of NGL from non-associated gas (MMBNGL).....	5.08	20.22
Total volume of all NGL (MMBNGL).....	10.73	26.11
NUMBER OF DEPOSITS		
Number of oil deposits.....	1.00	1.84
Number of non-associated gas deposits.....	0.11	0.37

Table RS6a. Undeformed Franklinian play—Volumetric parameters and oil accumulation characteristics.

[ft, feet; MMBO, millions of barrels of oil; rb/stb, reservoir barrels per stock tank barrel; bbl, barrel; STP, standard temperature and pressure—60°F and 1 atmosphere pressure]

HYDROCARBON VOLUME PARAMETERS							
Attributes	Probability of more than (fractiles)						Maximum
	100	95	75	50	25	5	
Net reservoir thickness (ft)	50	60	100	150	180	210	300
Area of closure (thousands of acres).....	2	3	6	8	10	13	20
Porosity (percent)	8	10	12	14	16	19	20
Water saturation (percent).....	25.0	20.0	16.7	14.3	12.5	10.5	10.0
Trap fill (percent).....	25	30	40	50	65	80	100
Trap depth (thousands of feet below sea level)	13	14	16	17	18	20	21
Average surface elevation (ft).....							75
Correlation between porosity and water saturation.....							-1
OIL ACCUMULATION CHARACTERISTICS							
Oil recovery factor (percent)							35
Type of reservoir drive (oil):							Depletion
FVF (Formation volume factor, in rb/stb)							
FVF = 1, for depth 2,170 ft							
FVF = $0.8913 + (5.01 \times 10^{-2} \times \text{Depth in thousands of feet})$, for 2,170 ft < depth < 12,150 ft							
FVF = 1.5, for depth 12,150 ft							
GOR (Associated-gas-to-oil ratio, in ft ³ /bbl at STP)							
$\log_{10}(\text{GOR}) = 2.092 + (0.066906 \times \text{Depth in thousands of feet})$							
NGLR (Natural-gas-liquids-to-associated-gas ratio, in bbl/million ft ³ at STP)							
$\text{NGLR} = 1 \times 10^6 / (5.36 \times 10^5 \times \exp(-0.254 \times \text{Depth in thousands of feet}))$							
Oil quality parameters	Associated gas quality parameters						
API gravity (degrees).....	35	CO ₂ contamination (percent).....					4
Sulfur content of oil (percent).....	0.2						
ALLOCATION							
Play area (thousands of acres, within 3-mile boundary).....							463.41
Hydrocarbon resources in 1002 area (percent).....							85
Hydrocarbon resources in non-1002 area (percent).....							15

Table RS6b. Undeformed Franklinian play—Numbers of prospects and probabilities for play and prospect attributes.

[MMBO, millions of barrels of oil]

Minimum reservoir size (MMBO, in place)..... 50

	Probability of more than						
	(fractiles)						
	100	95	75	50	25	5	Maximum
Number of prospects greater than the minimum size	6	7	10	12	16	20	24

PLAY ATTRIBUTES

	Probability of <u>favorable C, R, or F</u>	Calculated <u>value</u>
Charge (C).....	1	
Potential reservoir facies (R).....	0.7	
Timely trap formation (F).....	0.9	
Probability that the play is favorable (C × R × F).....		0.63

PROSPECT ATTRIBUTES

	Probability of <u>favorable c, r, or f</u>	
Charge (c).....	0.8	
Potential reservoir facies (r).....	0.2	
Timely trap formation (f).....	0.7	
Probability that a chosen prospect is favorable (c × r × f).....		0.112

FRACTION OF ACCUMULATIONS BEING OIL..... 0.8

Fraction of accumulations being non-associated gas (1 – Oil fraction)..... 0.2

Table RS6c. Undeformed Franklinian play—Mean values of in-place and technically recoverable hydrocarbons.

[Totals reported below are totals for all accumulation-size classes. MMBO, millions of barrels of oil; BCFG, billions of cubic feet of gas; NGL, natural gas liquids; MMBNGL, millions of barrels of natural gas liquids]

	Mean	Standard deviation
IN-PLACE RESOURCES		
Total volume of oil (MMBO).....	286.71	467.25
Total volume of associated-dissolved gas (BCFG).....	505.52	844.77
Total volume of non-associated gas (BCFG).....	234.94	683.16
Total volume of all gas (BCFG).....	740.46	1,150.02
Total volume of NGL from associated-dissolved gas (MMBNGL).....	48.92	82.78
Total volume of NGL from non-associated gas (MMBNGL).....	22.45	65.83
Total volume of all NGL (MMBNGL).....	71.37	111.81
TECHNICALLY RECOVERABLE RESOURCES		
Total volume of oil (MMBO).....	100.35	163.54
Total volume of associated-dissolved gas (BCFG).....	176.93	295.67
Total volume of non-associated gas (BCFG).....	176.20	512.37
Total volume of all gas (BCFG).....	353.14	622.31
Total volume of NGL from associated-dissolved gas (MMBNGL).....	17.12	28.97
Total volume of NGL from non-associated gas (MMBNGL).....	16.84	49.37
Total volume of all NGL (MMBNGL).....	33.96	60.18
NUMBER OF DEPOSITS		
Number of oil deposits.....	0.74	1.03
Number of non-associated gas deposits.....	0.19	0.47

Table RS6d. Undeformed Franklinian play—Distributions of in-place and technically recoverable hydrocarbons.

[Totals reported below are totals within each accumulation-size class. MMBO, millions of barrels of oil; BCFG, billions of cubic feet of gas; MMBNGL, millions of barrels of natural gas liquids; NGL, natural gas liquids; fr, from. Total gas volume is sum of volume of associated-dissolved gas plus volume of non-associated gas]

	IN-PLACE OIL—Accumulation-size classes (MMBO)												
	0– <8	8– <16	16– <32	32– <64	64– <128	128– <256	256– <512	512– <1,024	1,024– <2,048	2,048– <4,096	4,096– <8,192	8,192– <16,384	16,384– <32,768
Number of oil deposits.....	0.00	0.00	0.00	0.01	0.08	0.20	0.27	0.16	0.02	0.00	0.00	0.00	0.00
Total volume of oil (MMBO).....	0.00	0.00	0.00	0.47	7.66	37.32	100.16	109.75	30.25	1.11	0.00	0.00	0.00
	IN-PLACE GAS—Accumulation-size classes (BCFG)												
	0– <48	48– <96	96– <192	192– <384	384– <768	768– <1,536	1,536– <3,072	3,072– <6,144	6,144– <12,288	12,288– <24,576	24,576– <49,152	49,152– <98,304	98,304– <196,608
Number of non-associated gas deposits.....	0.00	0.00	0.00	0.01	0.05	0.08	0.04	0.01	0.00	0.00	0.00	0.00	0.00
Volume of associated-dissolved gas (BCFG).....	0.00	0.64	9.91	49.04	142.14	194.78	97.70	11.31	0.00	0.00	0.00	0.00	0.00
Volume of non-associated gas (BCFG).....	0.00	0.00	0.00	3.24	30.20	83.83	90.80	25.53	1.34	0.00	0.00	0.00	0.00
Total gas volume (BCFG).....	0.00	0.64	9.91	52.28	172.34	278.61	188.50	36.84	1.34	0.00	0.00	0.00	0.00
	IN-PLACE NATURAL GAS LIQUIDS—Accumulation-size classes (MMBNGL)												
	0– <8	8– <16	16– <32	32– <64	64– <128	128– <256	256– <512	512– <1,024	1,024– <2,048	2,048– <4,096	4,096– <8,192	8,192– <16,384	16,384– <32,768
Volume fr associated-dissolved gas (MMBNGL).....	0.07	0.69	3.52	10.89	18.40	12.78	2.43	0.14	0.00	0.00	0.00	0.00	0.00
Volume fr non-associated gas (MMBNGL).....	0.00	0.00	0.14	2.21	6.70	9.23	3.86	0.30	0.00	0.00	0.00	0.00	0.00
Total NGL volume (MMBNGL).....	0.07	0.69	3.66	13.10	25.10	22.01	6.29	0.44	0.00	0.00	0.00	0.00	0.00
	TECHNICALLY RECOVERABLE OIL—Accumulation-size classes (MMBO)												
	0– <8	8– <16	16– <32	32– <64	64– <128	128– <256	256– <512	512– <1,024	1,024– <2,048	2,048– <4,096	4,096– <8,192	8,192– <16,384	16,384– <32,768
Number of oil deposits.....	0.00	0.00	0.04	0.14	0.25	0.24	0.07	0.00	0.00	0.00	0.00	0.00	0.00
Total volume of oil (MMBO).....	0.00	0.00	0.91	6.60	23.59	42.23	24.26	2.67	0.08	0.00	0.00	0.00	0.00
	TECHNICALLY RECOVERABLE GAS—Accumulation-size classes (BCFG)												
	0– <48	48– <96	96– <192	192– <384	384– <768	768– <1,536	1,536– <3,072	3,072– <6,144	6,144– <12,288	12,288– <24,576	24,576– <49,152	49,152– <98,304	98,304– <196,608
Number of non-associated gas deposits.....	0.00	0.00	0.00	0.03	0.07	0.07	0.02	0.00	0.00	0.00	0.00	0.00	0.00
Volume of associated-dissolved gas (BCFG).....	1.10	8.64	31.74	66.16	54.14	14.17	0.98	0.00	0.00	0.00	0.00	0.00	0.00
Volume of non-associated gas (BCFG).....	0.00	0.00	0.00	8.14	37.48	74.31	49.33	6.95	0.00	0.00	0.00	0.00	0.00
Total gas volume (BCFG).....	1.10	8.64	31.74	74.30	91.62	88.48	50.31	6.95	0.00	0.00	0.00	0.00	0.00
	TECHNICALLY RECOVERABLE NATURAL GAS LIQUIDS—Accumulation-size classes (MMBNGL)												
	0– <8	8– <16	16– <32	32– <64	64– <128	128– <256	256– <512	512– <1,024	1,024– <2,048	2,048– <4,096	4,096– <8,192	8,192– <16,384	16,384– <32,768
Volume fr associated-dissolved gas (MMBNGL).....	0.69	2.29	5.50	6.14	2.30	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Volume fr non-associated gas (MMBNGL).....	0.00	0.01	0.47	2.85	6.60	5.61	1.26	0.04	0.00	0.00	0.00	0.00	0.00
Total NGL volume (MMBNGL).....	0.69	2.30	5.98	8.99	8.90	5.81	1.26	0.04	0.00	0.00	0.00	0.00	0.00

Table RS6e. Undeformed Franklinian play—Distributions of technically recoverable oil at 95th, 50th, and 5th fractiles.

[MMBO, millions of barrels of oil]

	TECHNICALLY RECOVERABLE OIL—Accumulation-size classes (MMBO)												
	0– <8	8– <16	16– <32	32– <64	64– <128	128– <256	256– <512	512– <1,024	1,024– <2,048	2,048– <4,096	4,096– <8,192	8,192– <16,384	16,384– <32,768
95th fractile													
Number of deposits.....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total volume of oil (MMBO).....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50th fractile													
Number of deposits.....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total volume of oil (MMBO).....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5th fractile													
Number of deposits.....	0.00	0.00	0.00	0.10	0.29	0.52	1.05	0.48	0.00	0.00	0.00	0.00	0.00
Total volume of oil (MMBO).....	0.00	0.00	0.00	2.66	12.63	49.37	194.73	193.45	0.00	0.00	0.00	0.00	0.00

Table RS7a. Deformed Franklinian play—Volumetric parameters and oil accumulation characteristics.

[ft, feet; MMBO, millions of barrels of oil; rb/stb, reservoir barrels per stock tank barrel; bbl, barrel; STP, standard temperature and pressure—60°F and 1 atmosphere pressure]

HYDROCARBON VOLUME PARAMETERS							
Attributes	Probability of more than (fractiles)						Maximum
	100	95	75	50	25	5	
Net reservoir thickness (ft)	90	135	200	300	600	1,000	1,215
Area of closure (thousands of acres).....	2	5	9	12	15	19	22
Porosity (percent)	8	10	12	14	16	19	20
Water saturation (percent).....	25.0	20.0	16.7	14.3	12.5	10.5	10.0
Trap fill (percent).....	20	25	35	45	60	75	100
Trap depth (thousands of feet below sea level)	5	6	8	10.5	15	20	25
Average surface elevation (ft).....							400
Correlation between porosity and water saturation.....							-1
OIL ACCUMULATION CHARACTERISTICS							
Oil recovery factor (percent)							35
Type of reservoir drive (oil):							Depletion
FVF (Formation volume factor, in rb/stb)							
FVF = 1, for depth 2,170 ft							
FVF = $0.8913 + (5.01 \times 10^{-2} \times \text{Depth in thousands of feet})$, for 2,170 ft < depth < 12,150 ft							
FVF = 1.5, for depth 12,150 ft							
GOR (Associated-gas-to-oil ratio, in ft ³ /bbl at STP)							
$\log_{10}(\text{GOR}) = 2.092 + (0.066906 \times \text{Depth in thousands of feet})$							
NGLR (Natural-gas-liquids-to-associated-gas ratio, in bbl/million ft ³ at STP)							
$\text{NGLR} = 1 \times 10^6 / (5.36 \times 10^5 \times \exp(-0.254 \times \text{Depth in thousands of feet}))$							
Oil quality parameters							
API gravity (degrees).....							35
Sulfur content of oil (percent).....							0.2
ALLOCATION							
Play area (thousands of acres, within 3-mile boundary).....							498.995
Hydrocarbon resources in 1002 area (percent).....							100
Hydrocarbon resources in non-1002 area (percent).....							0

Table RS7b. Deformed Franklinian play—Numbers of prospects and probabilities for play and prospect attributes.

[MMBO, millions of barrels of oil]

Minimum reservoir size (MMBO, in place)..... 50

	Probability of more than						
	(fractiles)						
	100	95	75	50	25	5	Maximum
Number of prospects greater than the minimum size	5	8	10	12	15	17	20

PLAY ATTRIBUTES

	Probability of <u>favorable C, R, or F</u>	Calculated <u>value</u>
Charge (C).....	1	
Potential reservoir facies (R).....	0.8	
Timely trap formation (F).....	0.5	
Probability that the play is favorable (C × R × F).....		0.4

PROSPECT ATTRIBUTES

	Probability of <u>favorable c, r, or f</u>	
Charge (c).....	0.8	
Potential reservoir facies (r).....	0.5	
Timely trap formation (f).....	0.2	
Probability that a chosen prospect is favorable (c × r × f).....		0.08

FRACTION OF ACCUMULATIONS BEING OIL..... 0.2

Fraction of accumulations being non-associated gas (1 – Oil fraction)..... 0.8

Table RS7c. Deformed Franklinian play—Mean values of in-place and technically recoverable hydrocarbons.

[Totals reported below are totals for all accumulation-size classes. MMBO, millions of barrels of oil; BCFG, billions of cubic feet of gas; NGL, natural gas liquids; MMBNGL, millions of barrels of natural gas liquids]

	Mean	Standard deviation
IN-PLACE RESOURCES		
Total volume of oil (MMBO).....	130.55	662.76
Total volume of associated-dissolved gas (BCFG).....	125.97	863.34
Total volume of non-associated gas (BCFG).....	1,087.88	3,044.99
Total volume of all gas (BCFG).....	1,213.86	3,216.85
Total volume of NGL from associated-dissolved gas (MMBNGL).....	8.75	80.19
Total volume of NGL from non-associated gas (MMBNGL).....	57.43	200.24
Total volume of all NGL (MMBNGL).....	66.18	218.53
TECHNICALLY RECOVERABLE RESOURCES		
Total volume of oil (MMBO).....	45.69	231.97
Total volume of associated-dissolved gas (BCFG).....	44.09	302.17
Total volume of non-associated gas (BCFG).....	815.91	2,283.74
Total volume of all gas (BCFG).....	860.00	2,322.42
Total volume of NGL from associated-dissolved gas (MMBNGL).....	3.06	28.06
Total volume of NGL from non-associated gas (MMBNGL).....	43.07	150.18
Total volume of all NGL (MMBNGL).....	46.13	153.83
NUMBER OF DEPOSITS		
Number of oil deposits.....	0.08	0.30
Number of non-associated gas deposits.....	0.31	0.67

Table RS7d. Deformed Franklinian play—Distributions of in-place and technically recoverable hydrocarbons.

[Totals reported below are totals within each accumulation-size class. MMBO, millions of barrels of oil; BCFG, billions of cubic feet of gas; MMBNGL, millions of barrels of natural gas liquids; NGL, natural gas liquids; fr, from. Total gas volume is sum of volume of associated-dissolved gas plus volume of non-associated gas]

	IN-PLACE OIL—Accumulation-size classes (MMBO)												
	0– <8	8– <16	16– <32	32– <64	64– <128	128– <256	256– <512	512– <1,024	1,024– <2,048	2,048– <4,096	4,096– <8,192	8,192– <16,384	16,384– <32,768
Number of oil deposits.....	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.02	0.02	0.01	0.00	0.00
Total volume of oil (MMBO).....	0.00	0.00	0.00	0.00	0.07	0.67	3.57	16.66	32.10	42.99	27.98	6.50	0.00
	IN-PLACE GAS—Accumulation-size classes (BCFG)												
	0– <48	48– <96	96– <192	192– <384	384– <768	768– <1,536	1,536– <3,072	3,072– <6,144	6,144– <12,288	12,288– <24,576	24,576– <49,152	49,152– <98,304	98,304– <196,608
Number of non-associated gas deposits.....	0.00	0.00	0.00	0.00	0.03	0.07	0.09	0.07	0.04	0.01	0.00	0.00	0.00
Volume of associated-dissolved gas (BCFG).....	0.00	0.08	0.65	3.45	10.19	21.86	26.65	31.59	17.14	8.83	5.52	0.00	0.00
Volume of non-associated gas (BCFG).....	0.00	0.00	0.00	1.20	17.25	79.61	199.98	295.95	323.76	157.82	12.31	0.00	0.00
Total gas volume (BCFG).....	0.00	0.08	0.65	4.65	27.44	101.48	226.63	327.54	340.90	166.65	17.83	0.00	0.00
	IN-PLACE NATURAL GAS LIQUIDS—Accumulation-size classes (MMBNGL)												
	0– <8	8– <16	16– <32	32– <64	64– <128	128– <256	256– <512	512– <1,024	1,024– <2,048	2,048– <4,096	4,096– <8,192	8,192– <16,384	16,384– <32,768
Volume fr associated-dissolved gas (MMBNGL).....	0.09	0.14	0.25	0.39	0.82	1.45	1.90	1.78	1.21	0.38	0.34	0.00	0.00
Volume fr non-associated gas (MMBNGL).....	0.07	0.33	1.00	2.61	5.36	9.79	11.63	14.22	11.03	1.21	0.19	0.00	0.00
Total NGL volume (MMBNGL).....	0.16	0.47	1.25	3.00	6.18	11.24	13.54	15.99	12.23	1.59	0.53	0.00	0.00
	TECHNICALLY RECOVERABLE OIL—Accumulation-size classes (MMBO)												
	0– <8	8– <16	16– <32	32– <64	64– <128	128– <256	256– <512	512– <1,024	1,024– <2,048	2,048– <4,096	4,096– <8,192	8,192– <16,384	16,384– <32,768
Number of oil deposits.....	0.00	0.00	0.00	0.00	0.01	0.02	0.02	0.02	0.01	0.00	0.00	0.00	0.00
Total volume of oil (MMBO).....	0.00	0.00	0.01	0.08	0.62	3.12	8.39	14.27	13.26	5.57	0.38	0.00	0.00
	TECHNICALLY RECOVERABLE GAS—Accumulation-size classes (BCFG)												
	0– <48	48– <96	96– <192	192– <384	384– <768	768– <1,536	1,536– <3,072	3,072– <6,144	6,144– <12,288	12,288– <24,576	24,576– <49,152	49,152– <98,304	98,304– <196,608
Number of non-associated gas deposits.....	0.00	0.00	0.00	0.01	0.05	0.08	0.08	0.06	0.03	0.00	0.00	0.00	0.00
Volume of associated-dissolved gas (BCFG).....	0.10	0.58	2.25	5.24	9.60	10.57	8.15	4.80	1.59	1.20	0.00	0.00	0.00
Volume of non-associated gas (BCFG).....	0.00	0.00	0.00	3.66	26.72	93.30	184.55	240.51	213.26	51.38	2.54	0.00	0.00
Total gas volume (BCFG).....	0.10	0.58	2.25	8.90	36.32	103.87	192.71	245.30	214.85	52.58	2.54	0.00	0.00
	TECHNICALLY RECOVERABLE NATURAL GAS LIQUIDS—Accumulation-size classes (MMBNGL)												
	0– <8	8– <16	16– <32	32– <64	64– <128	128– <256	256– <512	512– <1,024	1,024– <2,048	2,048– <4,096	4,096– <8,192	8,192– <16,384	16,384– <32,768
Volume fr associated-dissolved gas (MMBNGL).....	0.12	0.12	0.18	0.41	0.59	0.79	0.47	0.27	0.12	0.00	0.00	0.00	0.00
Volume fr non-associated gas (MMBNGL).....	0.12	0.42	1.12	2.61	5.23	8.68	9.74	10.38	4.43	0.35	0.00	0.00	0.00
Total NGL volume (MMBNGL).....	0.24	0.53	1.30	3.01	5.83	9.47	10.21	10.65	4.55	0.35	0.00	0.00	0.00

Table RS7e. Deformed Franklinian play—Distributions of technically recoverable gas at 95th, 50th, and 5th fractiles.

[BCFG, billions of cubic feet of gas; non-assoc, non-associated]

	TECHNICALLY RECOVERABLE GAS—Accumulation-size classes (BCFG)												
	0– <48	48– <96	96– <192	192– <384	384– <768	768– <1,536	1,536– <3,072	3,072– <6,144	6,144– <12,288	12,288– <24,576	24,576– <49,152	49,152– <98,304	98,304– <196,608
95th fractile													
Number of deposits.....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total volume of non-assoc gas (BCFG).....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50th fractile													
Number of deposits.....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total volume of non-assoc gas (BCFG).....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5th fractile													
Number of deposits.....	0.00	0.00	0.00	0.00	0.14	0.29	0.29	0.95	0.00	0.00	0.00	0.00	0.00
Total volume of non-assoc gas (BCFG).....	0.00	0.00	0.00	0.00	74.00	323.82	585.20	4,399.44	0.00	0.00	0.00	0.00	0.00

Table RS8a. Thin-Skinned Thrust-Belt play—Volumetric parameters and oil accumulation characteristics.

[ft, feet; MMBO, millions of barrels of oil; rb/stb, reservoir barrels per stock tank barrel; bbl, barrel; STP, standard temperature and pressure—60°F and 1 atmosphere pressure]

HYDROCARBON VOLUME PARAMETERS							
Attributes	Probability of more than (fractiles)						Maximum
	100	95	75	50	25	5	
Net reservoir thickness (ft)	90	100	150	225	300	600	700
Area of closure (thousands of acres).....	1	2	3.5	6	12	17	20
Porosity (percent)	9	10	13	15	18	24	30
Water saturation (percent).....	66.7	60.0	46.2	40.0	33.3	25.0	20.0
Trap fill (percent).....	20	25	40	50	60	80	100
Trap depth (thousands of feet below sea level)	1	1.5	3	4	6.5	9.5	12.5
Average surface elevation (ft).....							500
Correlation between porosity and water saturation.....							-1
OIL ACCUMULATION CHARACTERISTICS							
Oil recovery factor (percent)							40
Type of reservoir drive (oil):							Depletion
FVF (Formation volume factor, in rb/stb)							
FVF = 1, for depth 2,170 ft							
FVF = $0.8913 + (5.01 \times 10^{-2} \times \text{Depth in thousands of feet})$, for 2,170 ft < depth < 12,150 ft							
FVF = 1.5, for depth 12,150 ft							
GOR (Associated-gas-to-oil ratio, in ft ³ /bbl at STP)							
log ₁₀ (GOR) = $2.092 + (0.066906 \times \text{Depth in thousands of feet})$							
NGLR (Natural-gas-liquids-to-associated-gas ratio, in bbl/million ft ³ at STP)							
NGLR = $1 \times 10^6 / (5.36 \times 10^5 \times \exp(-0.254 \times \text{Depth in thousands of feet}))$							
Oil quality parameters							
API gravity (degrees).....							35
ALLOCATION							
Play area (thousands of acres, within 3-mile boundary).....							1,005.494
Hydrocarbon resources in 1002 area (percent).....							90
Hydrocarbon resources in non-1002 area (percent).....							10

Table RS8b. Thin-Skinned Thrust-Belt play—Numbers of prospects and probabilities for play and prospect attributes.

[MMBO, millions of barrels of oil]

Minimum reservoir size (MMBO, in place)..... 50

	Probability of more than						
	(fractiles)						
	100	95	75	50	25	5	Maximum
Number of prospects greater than the minimum size	17	25	30	40	45	50	60

PLAY ATTRIBUTES

	Probability of <u>favorable C, R, or F</u>	<u>Calculated value</u>
Charge (C).....	1	
Potential reservoir facies (R).....	1	
Timely trap formation (F).....	0.9	
Probability that the play is favorable (C × R × F).....		0.9

PROSPECT ATTRIBUTES

	Probability of <u>favorable c, r, or f</u>	
Charge (c).....	0.8	
Potential reservoir facies (r).....	0.5	
Timely trap formation (f).....	0.4	
Probability that a chosen prospect is favorable (c × r × f).....		0.16

FRACTION OF ACCUMULATIONS BEING OIL..... 0.7

Fraction of accumulations being non-associated gas (1 – Oil fraction)..... 0.3

Table RS8c. Thin-Skinned Thrust-Belt play—Mean values of in-place and technically recoverable hydrocarbons.

[Totals reported below are totals for all accumulation-size classes. MMBO, millions of barrels of oil; BCFG, billions of cubic feet of gas; NGL, natural gas liquids; MMBNGL, millions of barrels of natural gas liquids]

	Mean	Standard deviation
IN-PLACE RESOURCES		
Total volume of oil (MMBO).....	2,883.88	2,585.47
Total volume of associated-dissolved gas (BCFG).....	787.43	732.21
Total volume of non-associated gas (BCFG).....	1,962.23	2,289.54
Total volume of all gas (BCFG).....	2,749.66	2,489.87
Total volume of NGL from associated-dissolved gas (MMBNGL).....	8.35	11.63
Total volume of NGL from non-associated gas (MMBNGL).....	20.16	33.04
Total volume of all NGL (MMBNGL).....	28.51	35.57
TECHNICALLY RECOVERABLE RESOURCES		
Total volume of oil (MMBO).....	1,153.55	1,034.19
Total volume of associated-dissolved gas (BCFG).....	314.97	292.88
Total volume of non-associated gas (BCFG).....	1,471.67	1,717.16
Total volume of all gas (BCFG).....	1,786.64	1,777.87
Total volume of NGL from associated-dissolved gas (MMBNGL).....	3.34	4.65
Total volume of NGL from non-associated gas (MMBNGL).....	15.12	24.78
Total volume of all NGL (MMBNGL).....	18.46	25.44
NUMBER OF DEPOSITS		
Number of oil deposits.....	3.84	2.43
Number of non-associated gas deposits.....	1.64	1.43

Table RS8e. Thin-Skinned Thrust-Belt play—Distributions of technically recoverable oil at 95th, 50th, and 5th fractiles.

[MMBO, millions of barrels of oil]

	TECHNICALLY RECOVERABLE OIL—Accumulation-size classes (MMBO)												
	0– <8	8– <16	16– <32	32– <64	64– <128	128– <256	256– <512	512– <1,024	1,024– <2,048	2,048– <4,096	4,096– <8,192	8,192– <16,384	16,384– <32,768
95th fractile													
Number of deposits.....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total volume of oil (MMBO).....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50th fractile													
Number of deposits.....	0.00	0.00	0.10	0.76	1.57	1.10	1.29	0.10	0.00	0.00	0.00	0.00	0.00
Total volume of oil (MMBO).....	0.00	0.00	2.88	39.76	143.26	194.77	472.43	76.59	0.00	0.00	0.00	0.00	0.00
5th fractile													
Number of deposits.....	0.00	0.00	0.14	0.29	1.05	1.33	1.43	1.43	0.81	0.05	0.00	0.00	0.00
Total volume of oil (MMBO).....	0.00	0.00	3.82	13.65	105.52	264.67	524.29	980.48	1,166.69	116.95	0.00	0.00	0.00

Table RS9a. Ellesmerian Thrust-Belt play—Volumetric parameters and oil accumulation characteristics.

[ft, feet; MMBO, millions of barrels of oil; rb/stb, reservoir barrels per stock tank barrel; bbl, barrel; STP, standard temperature and pressure—60°F and 1 atmosphere pressure]

HYDROCARBON VOLUME PARAMETERS							
Attributes	Probability of more than (fractiles)						Maximum
	100	95	75	50	25	5	
Net reservoir thickness (ft)	50	100	200	300	400	500	1,500
Area of closure (thousands of acres).....	2	6	12	20	25	38	45
Porosity (percent)	6	8	10	11	13	15	18
Water saturation (percent).....	58.3	43.8	35.0	31.8	26.9	23.3	19.4
Trap fill (percent).....	10	15	20	25	40	50	100
Trap depth (thousands of feet below sea level)	2	3	5	7	9	12	17
Average surface elevation (ft).....							700
Correlation between porosity and water saturation.....							-1
OIL ACCUMULATION CHARACTERISTICS							
FVF (Formation volume factor, in rb/stb)							
FVF = 1, for depth 2,170 ft							
FVF = $0.8913 + (5.01 \times 10^{-2} \times \text{Depth in thousands of feet})$, for 2,170 ft < depth < 12,150 ft							
FVF = 1.5, for depth 12,150 ft							
GOR (Associated-gas-to-oil ratio, in ft ³ /bbl at STP)							
$\log_{10}(\text{GOR}) = 2.092 + (0.066906 \times \text{Depth in thousands of feet})$							
NGLR (Natural-gas-liquids-to-associated-gas ratio, in bbl/million ft ³ at STP)							
$\text{NGLR} = 1 \times 10^6 / (5.36 \times 10^5 \times \exp(-0.254 \times \text{Depth in thousands of feet}))$							
Non-associated gas quality parameters							
						CO ₂ contamination (percent).....	5
Other inert gases							
						N ₂ (percent)	2
ALLOCATION							
Play area (thousands of acres, within 3-mile boundary).....						471.773	
Hydrocarbon resources in 1002 area (percent).....						100	
Hydrocarbon resources in non-1002 area (percent).....						0	

Table RS9b. Ellesmerian Thrust-Belt play—Numbers of prospects and probabilities for play and prospect attributes.

[MMBO, millions of barrels of oil]

Minimum reservoir size (MMBO, in place)..... 50

	Probability of more than						
	(fractiles)						
	100	95	75	50	25	5	Maximum
Number of prospects greater than the minimum size	4	5	6	6.5	7	7	8

PLAY ATTRIBUTES

	Probability of <u>favorable C, R, or F</u>	Calculated <u>value</u>
Charge (C).....	1	
Potential reservoir facies (R).....	1	
Timely trap formation (F).....	1	
Probability that the play is favorable (C × R × F).....		1

PROSPECT ATTRIBUTES

	Probability of <u>favorable c, r, or f</u>	
Charge (c).....	0.9	
Potential reservoir facies (r).....	0.6	
Timely trap formation (f).....	0.2	
Probability that a chosen prospect is favorable (c × r × f).....		0.108

FRACTION OF ACCUMULATIONS BEING OIL..... 0

Fraction of accumulations being non-associated gas (1 – Oil fraction)..... 1

Table RS9c. Ellesmerian Thrust-Belt play—Mean values of in-place and technically recoverable hydrocarbons.

[Totals reported below are totals for all accumulation-size classes. MMBO, millions of barrels of oil; BCFG, billions of cubic feet of gas; NGL, natural gas liquids; MMBNGL, millions of barrels of natural gas liquids]

	Mean	Standard deviation
IN-PLACE RESOURCES		
Total volume of oil (MMBO).....	0.00	0.00
Total volume of associated-dissolved gas (BCFG).....	0.00	0.00
Total volume of non-associated gas (BCFG).....	1,167.65	1,986.89
Total volume of all gas (BCFG).....	1,167.65	1,986.89
Total volume of NGL from associated-dissolved gas (MMBNGL).....	0.00	0.00
Total volume of NGL from non-associated gas (MMBNGL).....	23.76	60.93
Total volume of all NGL (MMBNGL).....	23.76	60.93
TECHNICALLY RECOVERABLE RESOURCES		
Total volume of oil (MMBO).....	0.00	0.00
Total volume of associated-dissolved gas (BCFG).....	0.00	0.00
Total volume of non-associated gas (BCFG).....	.875.73	1,490.17
Total volume of all gas (BCFG).....	.875.73	1,490.17
Total volume of NGL from associated-dissolved gas (MMBNGL).....	0.00	0.00
Total volume of NGL from non-associated gas (MMBNGL).....	17.82	45.70
Total volume of all NGL (MMBNGL).....	17.82	45.70
NUMBER OF DEPOSITS		
Number of oil deposits.....	0.00	0.00
Number of non-associated gas deposits.....	0.69	0.79

Table RS9d. Ellesmerian Thrust-Belt play—Distributions of in-place and technically recoverable hydrocarbons.

[Totals reported below are totals within each accumulation-size class. MMBO, millions of barrels of oil; BCFG, billions of cubic feet of gas; MMBNGL, millions of barrels of natural gas liquids; NGL, natural gas liquids; fr, from. Total gas volume is sum of volume of associated-dissolved gas plus volume of non-associated gas]

	IN-PLACE OIL—Accumulation-size classes (MMBO)												
	0– <8	8– <16	16– <32	32– <64	64– <128	128– <256	256– <512	512– <1,024	1,024– <2,048	2,048– <4,096	4,096– <8,192	8,192– <16,384	16,384– <32,768
Number of oil deposits.....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total volume of oil (MMBO).....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	IN-PLACE GAS—Accumulation-size classes (BCFG)												
	0– <48	48– <96	96– <192	192– <384	384– <768	768– <1,536	1,536– <3,072	3,072– <6,144	6,144– <12,288	12,288– <24,576	24,576– <49,152	49,152– <98,304	98,304– <196,608
Number of non-associated gas deposits.....	0.00	0.00	0.00	0.04	0.18	0.22	0.16	0.07	0.01	0.00	0.00	0.00	0.00
Volume of associated-dissolved gas (BCFG).....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Volume of non-associated gas (BCFG).....	0.00	0.00	0.00	13.64	103.36	247.03	352.44	291.17	116.25	38.99	4.77	0.00	0.00
Total gas volume (BCFG).....	0.00	0.00	0.00	13.64	103.36	247.03	352.44	291.17	116.25	38.99	4.77	0.00	0.00
	IN-PLACE NATURAL GAS LIQUIDS—Accumulation-size classes (MMBNGL)												
	0– <8	8– <16	16– <32	32– <64	64– <128	128– <256	256– <512	512– <1,024	1,024– <2,048	2,048– <4,096	4,096– <8,192	8,192– <16,384	16,384– <32,768
Volume fr associated-dissolved gas (MMBNGL).....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Volume fr non-associated gas (MMBNGL).....	0.92	1.97	3.41	4.49	4.66	4.10	2.40	1.28	0.51	0.00	0.00	0.00	0.00
Total NGL volume (MMBNGL).....	0.92	1.97	3.41	4.49	4.66	4.10	2.40	1.28	0.51	0.00	0.00	0.00	0.00
	TECHNICALLY RECOVERABLE OIL—Accumulation-size classes (MMBO)												
	0– <8	8– <16	16– <32	32– <64	64– <128	128– <256	256– <512	512– <1,024	1,024– <2,048	2,048– <4,096	4,096– <8,192	8,192– <16,384	16,384– <32,768
Number of oil deposits.....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total volume of oil (MMBO).....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	TECHNICALLY RECOVERABLE GAS—Accumulation-size classes (BCFG)												
	0– <48	48– <96	96– <192	192– <384	384– <768	768– <1,536	1,536– <3,072	3,072– <6,144	6,144– <12,288	12,288– <24,576	24,576– <49,152	49,152– <98,304	98,304– <196,608
Number of non-associated gas deposits.....	0.00	0.00	0.00	0.10	0.21	0.21	0.12	0.04	0.01	0.00	0.00	0.00	0.00
Volume of associated-dissolved gas (BCFG).....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Volume of non-associated gas (BCFG).....	0.00	0.00	0.00	31.05	118.38	229.11	254.98	169.49	57.57	11.56	3.58	0.00	0.00
Total gas volume (BCFG).....	0.00	0.00	0.00	31.05	118.38	229.11	254.98	169.49	57.57	11.56	3.58	0.00	0.00
	TECHNICALLY RECOVERABLE NATURAL GAS LIQUIDS—Accumulation-size classes (MMBNGL)												
	0– <8	8– <16	16– <32	32– <64	64– <128	128– <256	256– <512	512– <1,024	1,024– <2,048	2,048– <4,096	4,096– <8,192	8,192– <16,384	16,384– <32,768
Volume fr associated-dissolved gas (MMBNGL).....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Volume fr non-associated gas (MMBNGL).....	1.14	1.93	2.90	3.64	3.24	2.76	1.46	0.61	0.13	0.00	0.00	0.00	0.00
Total NGL volume (MMBNGL).....	1.14	1.93	2.90	3.64	3.24	2.76	1.46	0.61	0.13	0.00	0.00	0.00	0.00

Table RS9e. Ellesmerian Thrust-Belt play—Distributions of technically recoverable gas at 95th, 50th, and 5th fractiles.

[BCFG, billions of cubic feet of gas; non-assoc, non-associated]

	TECHNICALLY RECOVERABLE GAS—Accumulation-size classes (BCFG)												
	0– <48	48– <96	96– <192	192– <384	384– <768	768– <1,536	1,536– <3,072	3,072– <6,144	6,144– <12,288	12,288– <24,576	24,576– <49,152	49,152– <98,304	98,304– <196,608
95th fractile													
Number of deposits.....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total volume of non-assoc gas (BCFG).....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50th fractile													
Number of deposits.....	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total volume of non-assoc gas (BCFG).....	0.00	0.00	0.00	277.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5th fractile													
Number of deposits.....	0.00	0.00	0.00	0.14	0.19	0.52	0.33	0.57	0.00	0.00	0.00	0.00	0.00
Total volume of non-assoc gas (BCFG).....	0.00	0.00	0.00	52.56	107.22	576.79	867.80	2,055.40	0.00	0.00	0.00	0.00	0.00

Table RS10a. Niguanak-Aurora two-dome scenario—Volumetric parameters oil and accumulation characteristics.

[ft, feet; MMBO, millions of barrels of oil; rb/stb, reservoir barrels per stock tank barrel; bbl, barrel; STP, standard temperature and pressure—60 °F and 1 atmosphere pressure]

HYDROCARBON VOLUME PARAMETERS							
Attributes	Probability of more than (fractiles)						Maximum
	100	95	75	50	25	5	
Net reservoir thickness (ft)	50	70	110	150	190	270	300
Area of closure (thousands of acres).....	120	130	155	180	205	235	250
Porosity (percent)	5	6	8	10	13	17	20
Water saturation (percent).....	50.0	41.7	31.3	25.0	19.2	14.7	12.5
Trap fill (percent).....	10	12	16	20	30	40	100
Trap depth (thousands of feet below sea level)	9	10	11	12	13	14	15
Average surface elevation (ft).....							100
Correlation between porosity and water saturation.....							-1
OIL ACCUMULATION CHARACTERISTICS							
Oil recovery factor (percent)							35
FVF (Formation volume factor, in rb/stb)							
FVF = 1, for depth 2,170 ft							
FVF = $0.8913 + (5.01 \times 10^{-2} \times \text{Depth in thousands of feet})$, for 2,170 ft < depth < 12,150 ft							
FVF = 1.5, for depth 12,150 ft							
GOR (Associated-gas-to-oil ratio, in ft ³ /bbl at STP)							
$\log_{10}(\text{GOR}) = 2.092 + (0.066906 \times \text{Depth in thousands of feet})$							
NGLR (Natural-gas-liquids-to-associated-gas ratio, in bbl/million ft ³ at STP)							
$\text{NGLR} = 1 \times 10^6 / (5.36 \times 10^5 \times \exp(-0.254 \times \text{Depth in thousands of feet}))$							
ALLOCATION							
Play area (thousands of acres, within 3-mile boundary).....							459.293
Hydrocarbon resources in 1002 area (percent).....							50
Hydrocarbon resources in non-1002 area (percent).....							50

Table RS10b. Niguanak-Aurora two-dome scenario—Numbers of prospects and probabilities for prospect attributes.

[MMBO, millions of barrels of oil]

Minimum reservoir size (MMBO, in place)..... 50

	Probability of more than						Maximum
	(fractiles)						
	100	95	75	50	25	5	
Number of prospects greater than the minimum size	2	2	2	2	2	2	2

NIGUANAK PROSPECT ATTRIBUTES	Probability of <u>favorable c, r, or f</u>	Calculated <u>value</u>
Charge (c).....	0.8	
Potential reservoir facies (r)	0.2	
Timely trap formation (f).....	0.5	
Probability that this prospect is favorable (c × r × f).....		0.08
AURORA PROSPECT ATTRIBUTES		
	Probability of <u>favorable c, r, or f</u>	
Charge (c).....	0.8	
Potential reservoir facies (r)	0.2	
Timely trap formation (f).....	0.6	
Probability that this prospect is favorable (c × r × f).....		0.096
FRACTION OF ACCUMULATIONS BEING OIL..... 0.9		
Fraction of accumulations being non-associated gas (1 – Oil fraction).....		0.1

Table RS10c. Niguanak-Aurora two-dome scenario—Mean values of in-place and technically recoverable hydrocarbons.

[Totals reported below are totals for all accumulation-size classes. MMBO, millions of barrels of oil; BCFG, billions of cubic feet of gas; NGL, natural gas liquids; MMBNGL, millions of barrels of natural gas liquids]

	Mean	Standard deviation
IN-PLACE RESOURCES		
Total volume of oil (MMBO).....	1,107.04	2,479.21
Total volume of associated-dissolved gas (BCFG).....	880.24	1,981.53
Total volume of non-associated gas (BCFG).....	298.72	1,932.61
Total volume of all gas (BCFG).....	1,178.96	2,804.94
Total volume of NGL from associated-dissolved gas (MMBNGL).....	38.67	94.82
Total volume of NGL from non-associated gas (MMBNGL).....	12.82	89.59
Total volume of all NGL (MMBNGL).....	51.49	132.02
TECHNICALLY RECOVERABLE RESOURCES		
Total volume of oil (MMBO).....	387.46	867.72
Total volume of associated-dissolved gas (BCFG).....	308.08	693.53
Total volume of non-associated gas (BCFG).....	224.04	1,449.45
Total volume of all gas (BCFG).....	532.12	1,623.59
Total volume of NGL from associated-dissolved gas (MMBNGL).....	13.53	33.19
Total volume of NGL from non-associated gas (MMBNGL).....	9.62	67.19
Total volume of all NGL (MMBNGL).....	23.15	75.66
NUMBER OF DEPOSITS		
Number of oil deposits.....	0.37	0.64
Number of non-associated gas deposits.....	0.04	0.21

Table RS10d. Niguanak-Aurora two-dome scenario—Distributions of in-place and technically recoverable hydrocarbons.

[Totals reported below are totals within each accumulation-size class. MMBO, millions of barrels of oil; BCFG, billions of cubic feet of gas; MMBNGL, millions of barrels of natural gas liquids; NGL, natural gas liquids; fr, from. Total gas volume is sum of volume of associated-dissolved gas plus volume of non-associated gas]

	IN-PLACE OIL—Accumulation-size classes (MMBO)												
	0– <8	8– <16	16– <32	32– <64	64– <128	128– <256	256– <512	512– <1,024	1,024– <2,048	2,048– <4,096	4,096– <8,192	8,192– <16,384	16,384– <32,768
Number of oil deposits.....	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.05	0.11	0.12	0.06	0.01	0.00
Total volume of oil (MMBO).....	0.00	0.00	0.00	0.00	0.00	0.18	4.00	37.22	172.76	352.10	359.82	138.37	42.59
	IN-PLACE GAS—Accumulation-size classes (BCFG)												
	0– <48	48– <96	96– <192	192– <384	384– <768	768– <1,536	1,536– <3,072	3,072– <6,144	6,144– <12,288	12,288– <24,576	24,576– <49,152	49,152– <98,304	98,304– <196,608
Number of non-associated gas deposits.....	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.01	0.00	0.00	0.00	0.00
Volume of associated-dissolved gas (BCFG).....	0.00	0.00	0.16	2.84	28.00	120.75	266.80	289.46	134.09	32.82	5.33	0.00	0.00
Volume of non-associated gas (BCFG).....	0.00	0.00	0.00	0.00	0.00	1.81	20.31	78.08	99.04	55.57	38.57	5.34	0.00
Total gas volume (BCFG).....	0.00	0.00	0.16	2.84	28.00	122.56	287.11	367.54	233.13	88.38	43.90	5.34	0.00
	IN-PLACE NATURAL GAS LIQUIDS—Accumulation-size classes (MMBNGL)												
	0– <8	8– <16	16– <32	32– <64	64– <128	128– <256	256– <512	512– <1,024	1,024– <2,048	2,048– <4,096	4,096– <8,192	8,192– <16,384	16,384– <32,768
Volume fr associated-dissolved gas (MMBNGL).....	0.02	0.24	1.34	4.53	9.78	11.81	7.76	2.51	0.67	0.00	0.00	0.00	0.00
Volume fr non-associated gas (MMBNGL).....	0.00	0.00	0.00	0.13	1.01	2.68	3.91	2.60	1.95	0.53	0.00	0.00	0.00
Total NGL volume (MMBNGL).....	0.02	0.24	1.35	4.66	10.79	14.49	11.67	5.11	2.62	0.53	0.00	0.00	0.00
	TECHNICALLY RECOVERABLE OIL—Accumulation-size classes (MMBO)												
	0– <8	8– <16	16– <32	32– <64	64– <128	128– <256	256– <512	512– <1,024	1,024– <2,048	2,048– <4,096	4,096– <8,192	8,192– <16,384	16,384– <32,768
Number of oil deposits.....	0.00	0.00	0.00	0.00	0.00	0.02	0.08	0.13	0.09	0.03	0.00	0.00	0.00
Total volume of oil (MMBO).....	0.00	0.00	0.00	0.00	0.41	4.91	32.68	96.85	133.41	88.14	24.12	6.94	0.00
	TECHNICALLY RECOVERABLE GAS—Accumulation-size classes (BCFG)												
	0– <48	48– <96	96– <192	192– <384	384– <768	768– <1,536	1,536– <3,072	3,072– <6,144	6,144– <12,288	12,288– <24,576	24,576– <49,152	49,152– <98,304	98,304– <196,608
Number of non-associated gas deposits.....	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.01	0.00	0.00	0.00	0.00
Volume of associated-dissolved gas (BCFG).....	0.00	0.29	3.48	22.05	72.03	103.72	80.89	18.14	7.48	0.00	0.00	0.00	0.00
Volume of non-associated gas (BCFG).....	0.00	0.00	0.00	0.00	0.08	3.73	29.65	72.55	66.58	39.34	12.11	0.00	0.00
Total gas volume (BCFG).....	0.00	0.29	3.48	22.05	72.11	107.45	110.54	90.70	74.06	39.34	12.11	0.00	0.00
	TECHNICALLY RECOVERABLE NATURAL GAS LIQUIDS—Accumulation-size classes (MMBNGL)												
	0– <8	8– <16	16– <32	32– <64	64– <128	128– <256	256– <512	512– <1,024	1,024– <2,048	2,048– <4,096	4,096– <8,192	8,192– <16,384	16,384– <32,768
Volume fr associated-dissolved gas (MMBNGL).....	0.25	0.92	2.56	3.82	3.87	1.59	0.46	0.06	0.00	0.00	0.00	0.00	0.00
Volume fr non-associated gas (MMBNGL).....	0.00	0.00	0.01	0.25	1.24	2.54	2.86	1.68	0.79	0.24	0.00	0.00	0.00
Total NGL volume (MMBNGL).....	0.25	0.92	2.57	4.07	5.12	4.14	3.32	1.74	0.79	0.24	0.00	0.00	0.00

Table RS10e. Niguanak-Aurora two-dome scenario—Distributions of technically recoverable oil at 95th, 50th, and 5th fractiles.

[MMBO, millions of barrels of oil]

	TECHNICALLY RECOVERABLE OIL—Accumulation-size classes (MMBO)												
	0– <8	8– <16	16– <32	32– <64	64– <128	128– <256	256– <512	512– <1,024	1,024– <2,048	2,048– <4,096	4,096– <8,192	8,192– <16,384	16,384– <32,768
95th fractile													
Number of deposits.....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total volume of oil (MMBO).....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50th fractile													
Number of deposits.....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total volume of oil (MMBO).....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5th fractile													
Number of deposits.....	0.00	0.00	0.00	0.00	0.00	0.10	0.05	0.48	0.62	0.38	0.00	0.00	0.00
Total volume of oil (MMBO).....	0.00	0.00	0.00	0.00	0.00	20.25	14.15	398.74	881.94	813.43	0.00	0.00	0.00

Table RS11a. Niguanak-Aurora many-prospect scenario—Volumetric parameters and oil accumulation characteristics.

[ft, feet; MMBO, millions of barrels of oil; rb/stb, reservoir barrels per stock tank barrel; bbl, barrel; STP, standard temperature and pressure—60°F and 1 atmosphere pressure]

HYDROCARBON VOLUME PARAMETERS							
Attributes	Probability of more than (fractiles)						Maximum
	100	95	75	50	25	5	
Net reservoir thickness (ft)	50	70	110	150	190	270	300
Area of closure (thousands of acres).....	5	7.5	12.5	20	40	80	120
Porosity (percent)	5	6	8	10	13	17	20
Water saturation (percent).....	50.0	41.7	31.3	25.0	19.2	14.7	12.5
Trap fill (percent).....	20	25	35	45	60	75	100
Trap depth (thousands of feet below sea level)	8.5	9	11	13	15	17	18
Average surface elevation (ft).....							100
Correlation between porosity and water saturation.....							-1

OIL ACCUMULATION CHARACTERISTICS	
Oil recovery factor (percent)	35
FVF (Formation volume factor, in rb/stb)	
FVF = 1, for depth 2,170 ft	
FVF = $0.8913 + (5.01 \times 10^{-2} \times \text{Depth in thousands of feet})$, for 2,170 ft < depth < 12,150 ft	
FVF = 1.5, for depth 12,150 ft	
GOR (Associated-gas-to-oil ratio, in ft ³ /bbl at STP)	
$\log_{10}(\text{GOR}) = 2.092 + (0.066906 \times \text{Depth in thousands of feet})$	
NGLR (Natural-gas-liquids-to-associated-gas ratio, in bbl/million ft ³ at STP)	
$\text{NGLR} = 1 \times 10^6 / (5.36 \times 10^5 \times \exp(-0.254 \times \text{Depth in thousands of feet}))$	
Oil quality parameters	
API gravity (degrees).....	35

ALLOCATION	
Play area (thousands of acres, within 3-mile boundary).....	459.293
Hydrocarbon resources in 1002 area (percent).....	50
Hydrocarbon resources in non-1002 area (percent).....	50

Table RS11b. Niguanak-Aurora many-prospect scenario—Numbers of prospects and probabilities for play and prospect attributes.

[MMBO, millions of barrels of oil]

Minimum reservoir size (MMBO, in place)..... 50

	Probability of more than (fractiles)						
	100	95	75	50	25	5	Maximum
Number of prospects greater than the minimum size	1	3	7	10	13	18	20

PLAY ATTRIBUTES	Probability of <u>favorable C, R, or F</u>	Calculated <u>value</u>
Charge (C).....	0.9	
Potential reservoir facies (R).....	0.8	
Timely trap formation (F).....	0.9	
Probability that the play is favorable (C × R × F).....		0.648

PROSPECT ATTRIBUTES	Probability of <u>favorable c, r, or f</u>	
Charge (c).....	0.7	
Potential reservoir facies (r).....	0.4	
Timely trap formation (f).....	0.6	
Probability that a chosen prospect is favorable (c × r × f).....		0.168

FRACTION OF ACCUMULATIONS BEING OIL.....	0.9
Fraction of accumulations being non-associated gas (1 – Oil fraction).....	0.1

Table RS11c. Niguanak-Aurora many-prospect scenario—Mean values of in-place and technically recoverable hydrocarbons.

[Totals reported below are totals for all accumulation-size classes. MMBO, millions of barrels of oil; BCFG, billions of cubic feet of gas; NGL, natural gas liquids; MMBNGL, millions of barrels of natural gas liquids]

	Mean	Standard deviation
IN-PLACE RESOURCES		
Total volume of oil (MMBO).....	1,018.62	1,866.04
Total volume of associated-dissolved gas (BCFG).....	994.65	1,905.27
Total volume of non-associated gas (BCFG).....	272.10	1,357.82
Total volume of all gas (BCFG).....	1,266.75	2,417.62
Total volume of NGL from associated-dissolved gas (MMBNGL).....	66.46	149.18
Total volume of NGL from non-associated gas (MMBNGL).....	16.01	91.48
Total volume of all NGL (MMBNGL).....	82.48	179.36
TECHNICALLY RECOVERABLE RESOURCES		
Total volume of oil (MMBO).....	356.52	653.12
Total volume of associated-dissolved gas (BCFG).....	348.13	666.85
Total volume of non-associated gas (BCFG).....	204.07	1,018.36
Total volume of all gas (BCFG).....	552.20	1,256.65
Total volume of NGL from associated-dissolved gas (MMBNGL).....	23.26	52.21
Total volume of NGL from non-associated gas (MMBNGL).....	12.01	68.61
Total volume of all NGL (MMBNGL).....	35.27	88.54
NUMBER OF DEPOSITS		
Number of oil deposits.....	0.98	1.29
Number of non-associated gas deposits.....	0.11	0.35

Table RS11d. Niguanak-Aurora many-prospect scenario—Distributions of in-place and technically recoverable hydrocarbons.

[Totals reported below are totals within each accumulation-size class. MMBO, millions of barrels of oil; BCFG, billions of cubic feet of gas; MMBNGL, millions of barrels of natural gas liquids; NGL, natural gas liquids; fr, from. Total gas volume is sum of volume of associated-dissolved gas plus volume of non-associated gas]

	IN-PLACE OIL—Accumulation-size classes (MMBO)												
	0– <8	8– <16	16– <32	32– <64	64– <128	128– <256	256– <512	512– <1,024	1,024– <2,048	2,048– <4,096	4,096– <8,192	8,192– <16,384	16,384– <32,768
Number of oil deposits.....	0.00	0.00	0.00	0.01	0.05	0.15	0.23	0.24	0.18	0.09	0.03	0.01	0.00
Total volume of oil (MMBO).....	0.00	0.00	0.00	0.34	5.12	29.09	85.75	175.18	260.35	255.09	156.35	50.28	1.07
	IN-PLACE GAS—Accumulation-size classes (BCFG)												
	0– <48	48– <96	96– <192	192– <384	384– <768	768– <1,536	1,536– <3,072	3,072– <6,144	6,144– <12,288	12,288– <24,576	24,576– <49,152	49,152– <98,304	98,304– <196,608
Number of non-associated gas deposits.....	0.00	0.00	0.00	0.01	0.02	0.03	0.02	0.02	0.01	0.00	0.00	0.00	0.00
Volume of associated-dissolved gas (BCFG).....	0.25	2.96	17.24	57.05	131.84	211.02	258.10	199.48	96.42	20.28	0.00	0.00	0.00
Volume of non-associated gas (BCFG).....	0.00	0.00	0.00	1.88	13.59	31.63	51.86	77.88	55.87	28.42	10.96	0.00	0.00
Total gas volume (BCFG).....	0.25	2.96	17.24	58.93	145.44	242.66	309.96	277.36	152.29	48.70	10.96	0.00	0.00
	IN-PLACE NATURAL GAS LIQUIDS—Accumulation-size classes (MMBNGL)												
	0– <8	8– <16	16– <32	32– <64	64– <128	128– <256	256– <512	512– <1,024	1,024– <2,048	2,048– <4,096	4,096– <8,192	8,192– <16,384	16,384– <32,768
Volume fr associated-dissolved gas (MMBNGL).....	0.84	1.85	4.23	8.29	12.34	14.60	13.33	8.01	2.84	0.13	0.00	0.00	0.00
Volume fr non-associated gas (MMBNGL).....	0.01	0.09	0.41	1.10	2.23	3.64	3.43	2.89	1.39	0.81	0.00	0.00	0.00
Total NGL volume (MMBNGL).....	0.84	1.94	4.64	9.40	14.57	18.24	16.77	10.90	4.23	0.95	0.00	0.00	0.00
	TECHNICALLY RECOVERABLE OIL—Accumulation-size classes (MMBO)												
	0– <8	8– <16	16– <32	32– <64	64– <128	128– <256	256– <512	512– <1,024	1,024– <2,048	2,048– <4,096	4,096– <8,192	8,192– <16,384	16,384– <32,768
Number of oil deposits.....	0.00	0.00	0.02	0.10	0.20	0.24	0.22	0.14	0.05	0.01	0.00	0.00	0.00
Total volume of oil (MMBO).....	0.00	0.00	0.63	4.67	19.37	43.74	78.97	95.88	73.55	35.53	4.18	0.00	0.00
	TECHNICALLY RECOVERABLE GAS—Accumulation-size classes (BCFG)												
	0– <48	48– <96	96– <192	192– <384	384– <768	768– <1,536	1,536– <3,072	3,072– <6,144	6,144– <12,288	12,288– <24,576	24,576– <49,152	49,152– <98,304	98,304– <196,608
Number of non-associated gas deposits.....	0.00	0.00	0.00	0.01	0.03	0.03	0.02	0.01	0.00	0.00	0.00	0.00	0.00
Volume of associated-dissolved gas (BCFG).....	3.14	11.74	32.23	60.54	87.18	80.94	52.45	19.04	0.88	0.00	0.00	0.00	0.00
Volume of non-associated gas (BCFG).....	0.00	0.00	0.00	3.95	15.41	30.50	47.94	56.01	31.73	16.78	1.75	0.00	0.00
Total gas volume (BCFG).....	3.14	11.74	32.23	64.49	102.59	111.44	100.39	75.05	32.60	16.78	1.75	0.00	0.00
	TECHNICALLY RECOVERABLE NATURAL GAS LIQUIDS—Accumulation-size classes (MMBNGL)												
	0– <8	8– <16	16– <32	32– <64	64– <128	128– <256	256– <512	512– <1,024	1,024– <2,048	2,048– <4,096	4,096– <8,192	8,192– <16,384	16,384– <32,768
Volume fr associated-dissolved gas (MMBNGL).....	1.57	2.15	3.70	4.80	5.21	3.71	1.85	0.27	0.00	0.00	0.00	0.00	0.00
Volume fr non-associated gas (MMBNGL).....	0.02	0.14	0.49	1.11	2.24	2.60	2.65	1.85	0.66	0.27	0.00	0.00	0.00
Total NGL volume (MMBNGL).....	1.59	2.29	4.19	5.91	7.45	6.31	4.49	2.11	0.66	0.27	0.00	0.00	0.00

Table RS11e. Niguanak-Aurora many-prospect scenario—Distributions of technically recoverable oil at 95th, 50th, and 5th fractiles.

[MMBO, millions of barrels of oil]

	TECHNICALLY RECOVERABLE OIL—Accumulation-size classes (MMBO)												
	0– <8	8– <16	16– <32	32– <64	64– <128	128– <256	256– <512	512– <1,024	1,024– <2,048	2,048– <4,096	4,096– <8,192	8,192– <16,384	16,384– <32,768
95th fractile													
Number of deposits.....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total volume of oil (MMBO).....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50th fractile													
Number of deposits.....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total volume of oil (MMBO).....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5th fractile													
Number of deposits.....	0.00	0.00	0.00	0.24	0.38	0.52	0.57	0.52	0.67	0.00	0.00	0.00	0.00
Total volume of oil (MMBO).....	0.00	0.00	0.00	11.99	41.20	89.32	215.06	367.69	934.36	0.00	0.00	0.00	0.00

Table RS12. Gas characteristics for all plays.

[bbl, barrels; MMCFG, millions of cubic feet of gas; psi, pounds per square inch]

NON-ASSOCIATED GAS ACCUMULATION CHARACTERISTICS

Non-associated gas recovery factor (percent).....75

NGL/NAG (Ratio of natural gas liquids plus condensate to non-associated gas, in bbl/MMCFG)

$$\text{NGL/NAG} = 0.8595 \times \exp(0.05217 \times \text{Depth}^* \text{ in thousands of feet})$$

P_o (Original reservoir pressure, in psi, for plays in the deformed area)

$$P_o = 14.7 + (470 \times \text{Depth in thousands of feet}), \text{ for all depths}$$

P_o (Original reservoir pressure, in psi, for plays in the undeformed area)

$$P_o = 14.7 + (470 \times \text{Depth in thousands of feet}), \text{ for depth } \leq 10,000 \text{ ft}$$

$$P_o = 14.7 + (700 \times \text{Depth in thousands of feet}), \text{ for depth } > 10,000 \text{ ft}$$

T (Temperature, in degrees Rankine)

$$T = 473.7 + (16.458 \times \text{Depth in thousands of feet})$$

Z (Gas compressibility factor)

$$Z = \text{GASPVT},^{**} \text{ for depths } \geq 3,000 \text{ ft}$$

$$Z = 1 - (0.11 \times \text{Depth in thousands of feet}) + 0.0125 \times (\text{Depth in thousands of feet})^2, \text{ for depths } < 3,000 \text{ ft}$$

* All depths are subsurface.

** Microcomputer programs for petroleum engineers, 1983: Houston, Texas, Gulf Publishing Co.

Table RS13. Fractile estimates of technically recoverable resources in entire play area, listed by play.

[Volumes shown below by play represents total volumes in all accumulation-size classes for that play. Small amounts of non-associated gas may also occur in some oil plays. MMBO, millions of barrels of oil; BCFG, billions of cubic feet of gas. Leaders (--) indicate that data is not available]

Oil play name	Volume of technically recoverable oil (MMBO)			Number of oil deposits		
	fractiles			fractiles		
	95th	50th	5th	95th	50th	5th
Topset.....	2,412.43	5,831.46	11,111.86	12.57	22.19	30.91
Turbidite.....	492.80	1,484.98	3,111.18	6.14	13.29	21.05
Wedge.....	0.00	382.41	1,555.78	0.00	2.95	6.76
Thomson.....	0.00	213.17	1,267.79	0.00	1.67	3.10
Kemik.....	0.00	0.00	289.61	0.00	0.00	4.95
Undeformed Franklinian.....	0.00	0.00	452.84	0.00	0.00	2.43
Thin-Skinned Thrust-Belt.....	0.00	929.68	3,176.07	0.00	4.91	6.52
Niguanak-Aurora ¹	0.00	166.51	1,436.84	--	--	--

Gas play name	Volume of technically recoverable non-associated gas (BCFG)			Number of non-associated gas deposits		
	fractiles			fractiles		
	95th	50th	5th	95th	50th	5th
Deformed Franklinian ²	0.00	0.00	5,382.45	0.00	0.00	1.67
Ellesmerian Thrust-Belt.....	0.00	277.42	3,659.76	0.00	1.00	1.76

¹ Aggregate of two-dome and many-prospect scenarios.

² Twenty percent of the accumulations are oil.

Table RS14. Aggregate summary of resource estimates.

[Oil volumes in millions of barrels of oil. Gas volumes in billions of cubic feet of gas. Volume of natural gas liquids in millions of barrels of natural gas liquids. NGL, natural gas liquids; ADG, associated-dissolved gas; NAGD, non-associated dissolved gas]

	VOLUME OF IN-PLACE RESOURCES				VOLUME OF TECHNICALLY RECOVERABLE RESOURCES				FRACTILE AT MINIMUM VOLUME¹
	Means	Fractiles			Means	Fractiles			
		95	50	5		95	50	5	
Oil in entire assessment area.....	27,778	15,577	27,026	42,319	10,360	5,724	10,062	15,955	100
Oil in 1002 area.....	20,731	11,587	20,229	31,519	7,687	4,254	7,481	11,799	100
Oil in 1002 undeformed area.....	17,483	9,428	16,880	27,435	6,420	3,403	6,186	10,224	100
Oil in 1002 deformed area.....	3,249	0	2,779	8,142	1,267	0	1,084	3,185	94
Non-associated gas in entire assessment area.....	5,121	0	3,931	14,469	3,841	0	2,948	10,852	94
Non-associated gas in 1002 area.....	4,643	0	3,528	13,354	3,483	0	2,646	10,015	94
Non-associated gas in 1002 undeformed area.....	482	0	0	2,384	361	0	0	1,788	37
Non-associated gas in 1002 deformed area.....	4,162	0	3,019	12,582	3,121	0	2,264	9,437	91
NGL from ADG in entire assessment area.....	557				190				
NGL from ADG in 1002 area.....	423				143				
NGL from ADG in 1002 undeformed area.....	377				127				
NGL from ADG in 1002 deformed area.....	45				16				
NGL from NADG in entire assessment area.....	171				128				
NGL from NADG in 1002 area.....	149				112				
NGL from NADG in undeformed 1002 area.....	42				32				
NGL from NADG in deformed 1002 area.....	107				80				
ADG in entire assessment area.....	13,418				4,764				
ADG in 1002 area.....	10,109				3,558				
ADG in undeformed 1002 area.....	8,794				3,063				
ADG in deformed 1002 area.....	1,315				496				

¹ Same for in-place and technically recoverable resources.

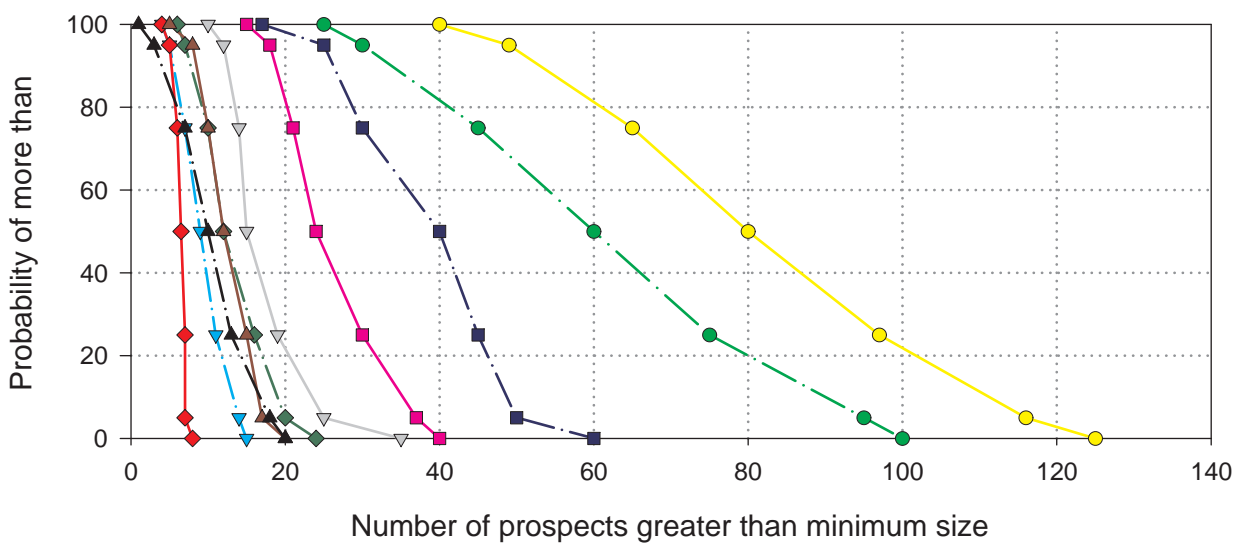
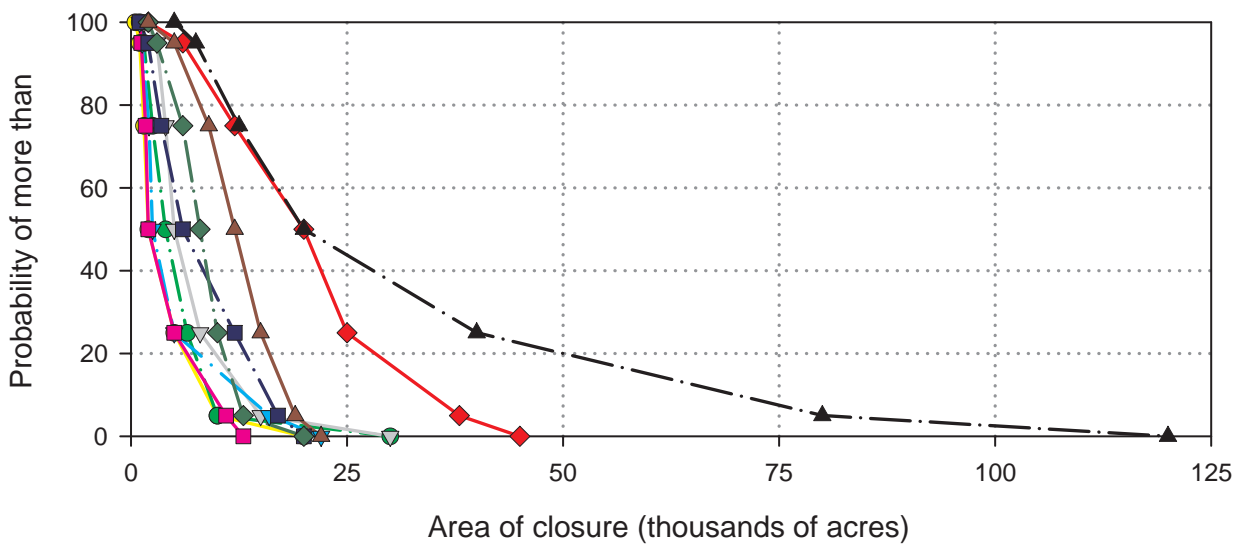
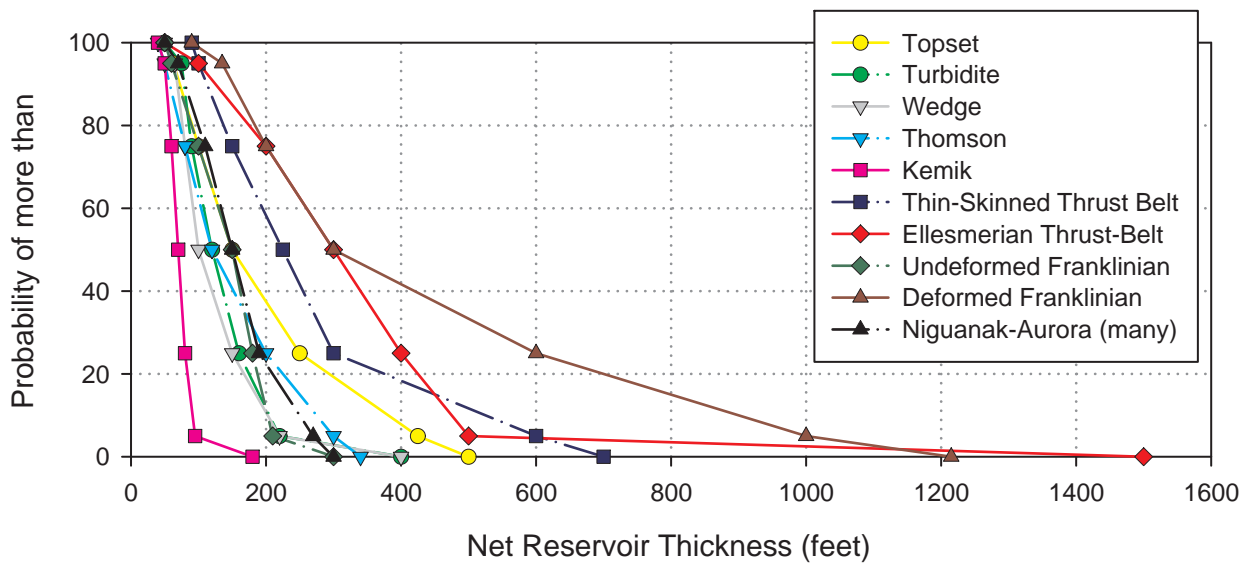


Figure RS1a. Distributions of hydrocarbon volume parameters, depths, and number of deposits, with symbols and line types representing different plays. Niguanak-Aurora distributions are for the many-prospects scenario.

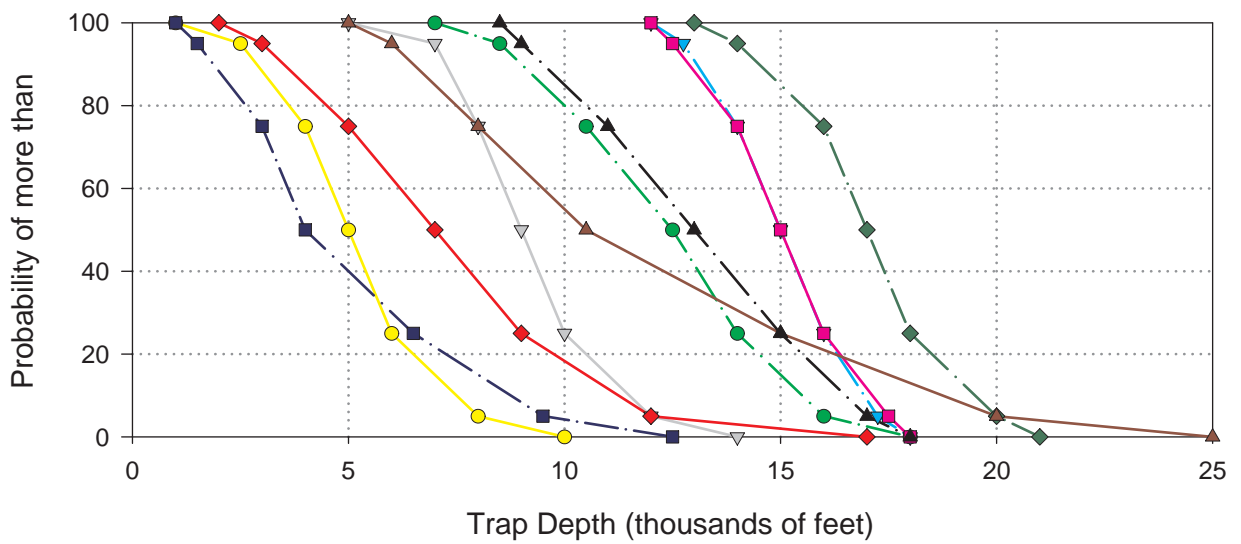
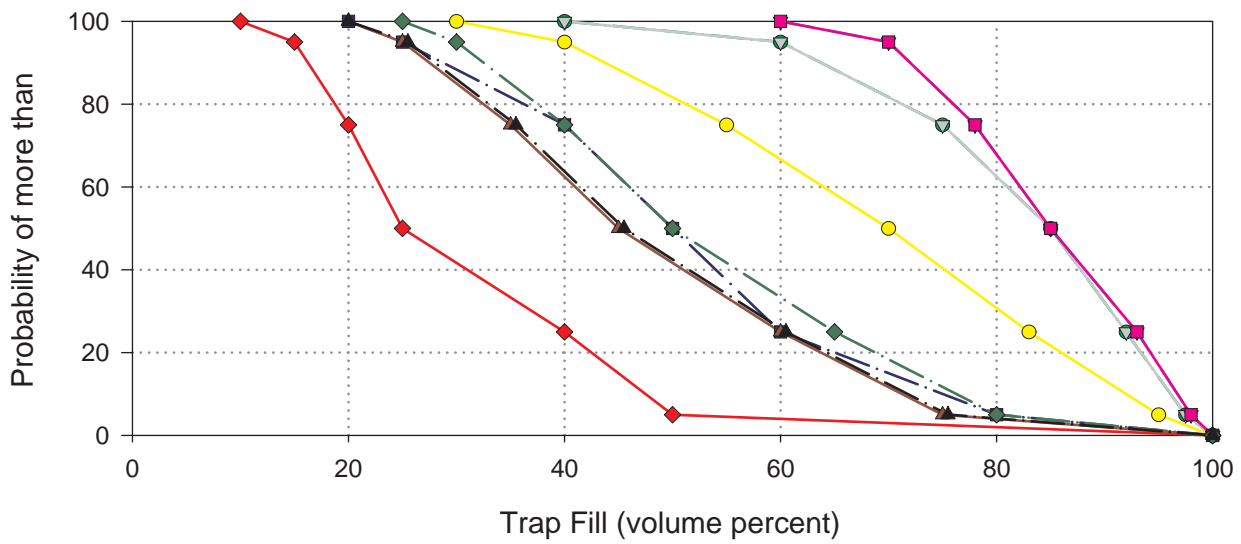
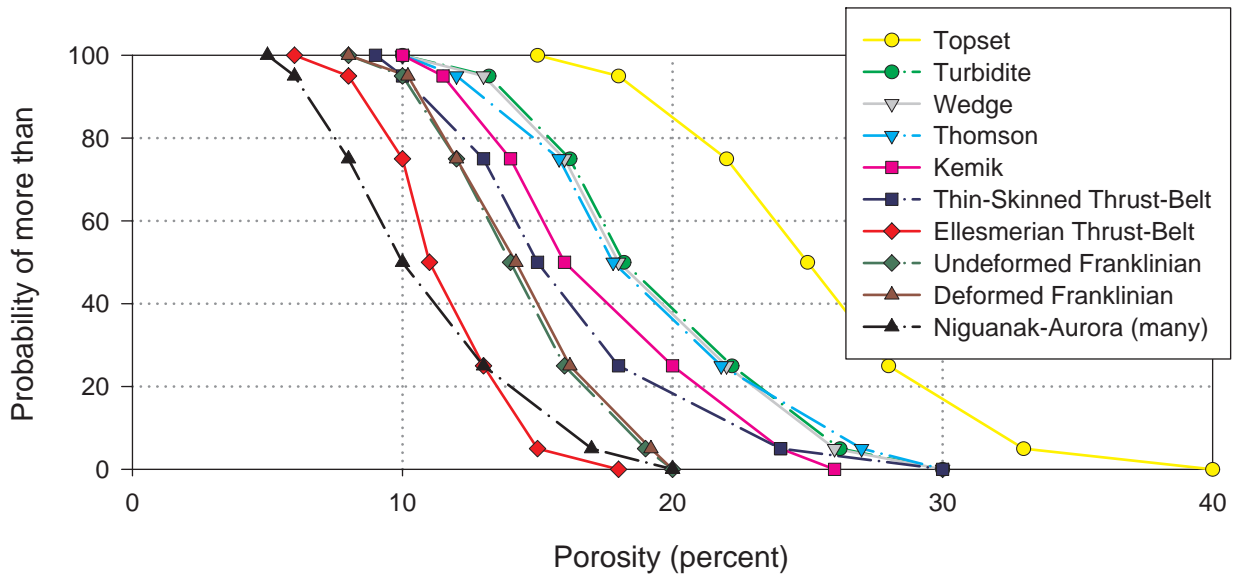


Figure RS1b. Distributions of hydrocarbon volume parameters, depths, and number of deposits, with symbols and line types representing different plays. Niguanak-Aurora distributions are for the many-prospects scenario.

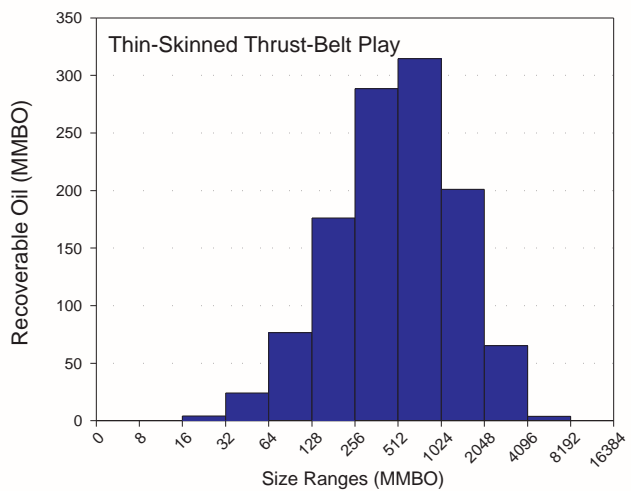
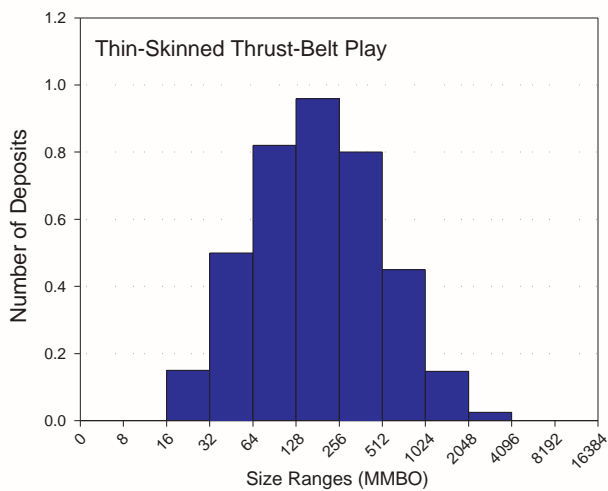
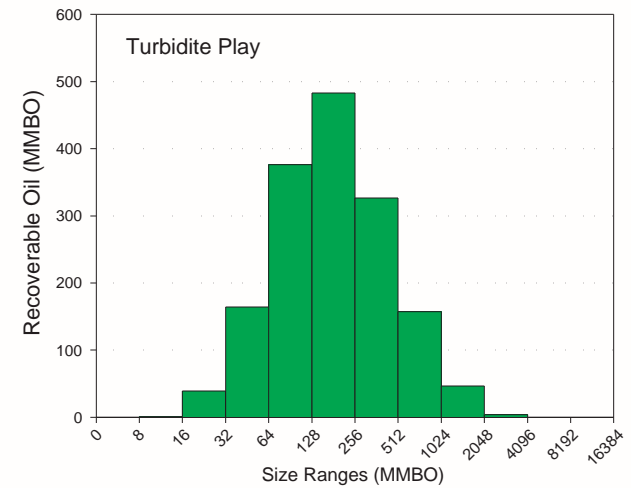
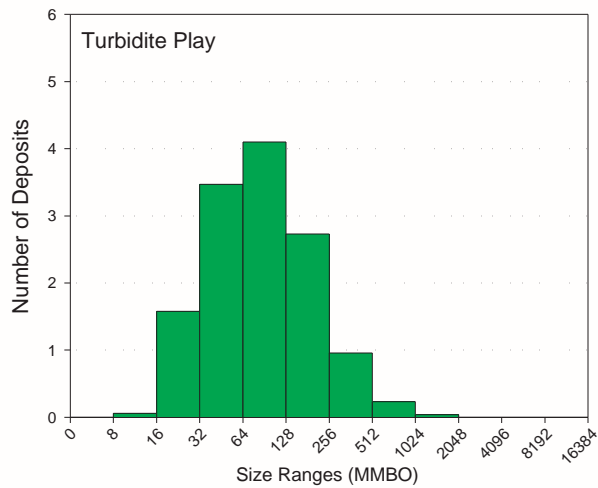
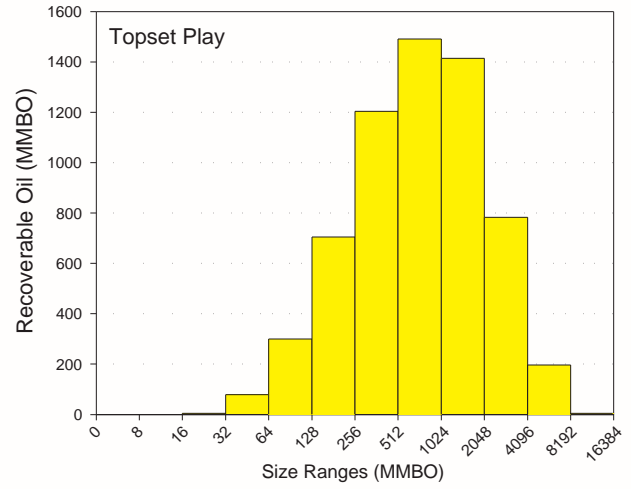
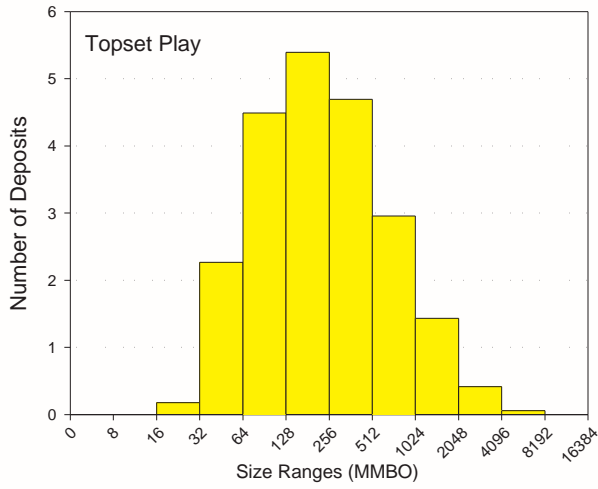


Figure RS2a. Number of deposits and volume of technically recoverable oil, given as distributions of recoverable resources. Plays are presented in descending order of total recoverable oil.

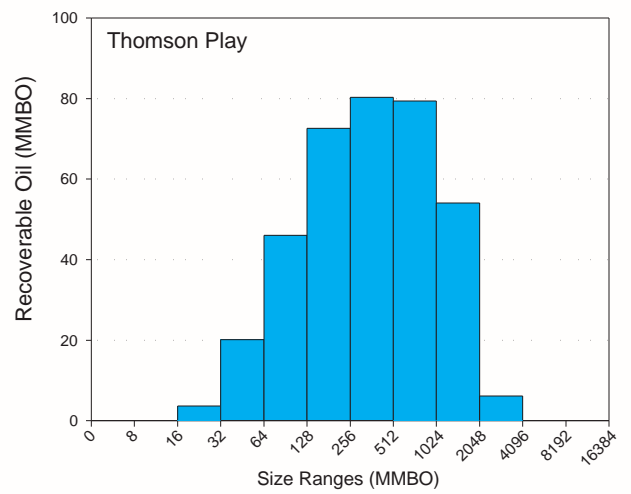
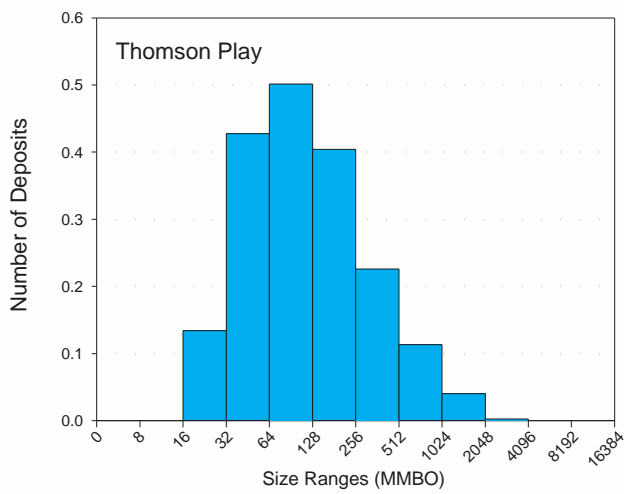
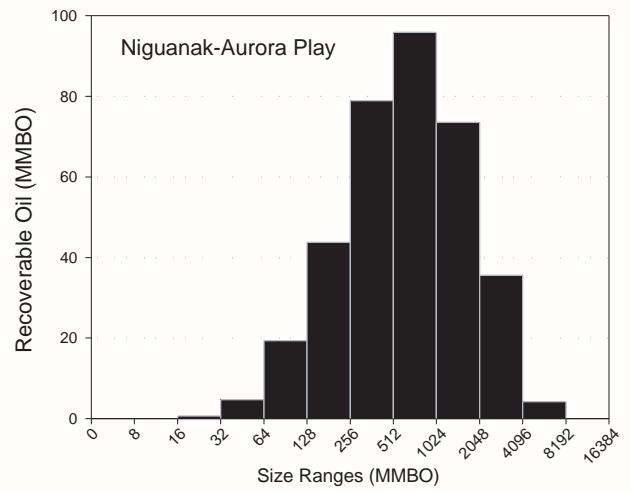
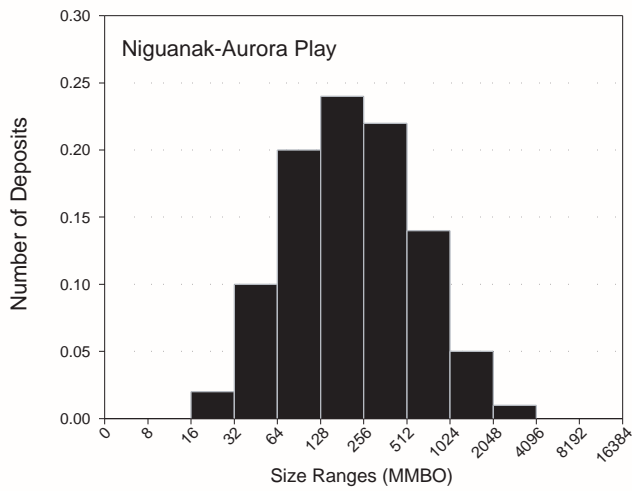
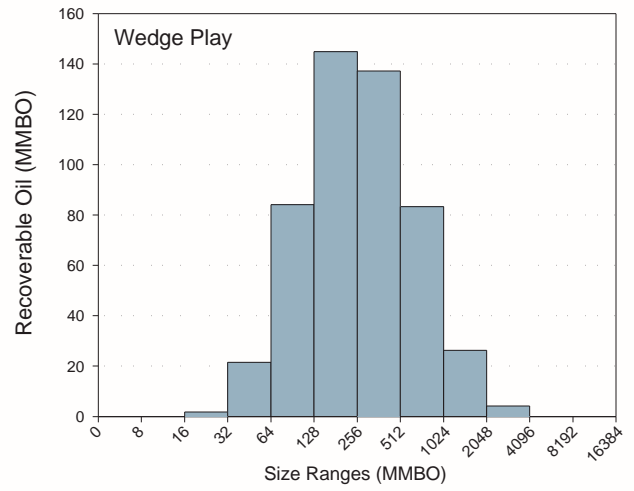
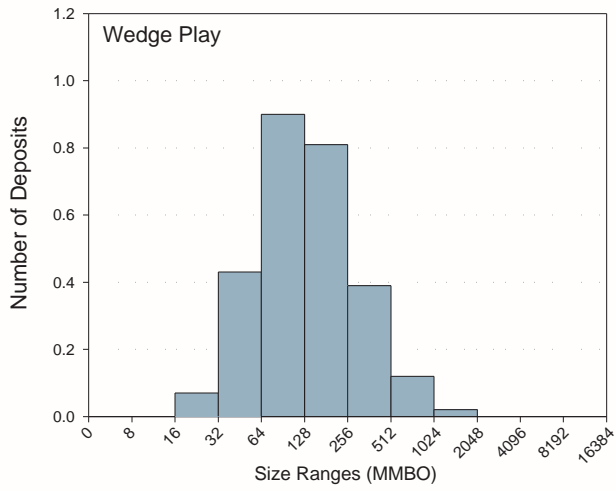


Figure RS2b. Number of deposits and volume of technically recoverable oil, given as distributions of recoverable resources. Plays are presented in descending order of total recoverable oil.

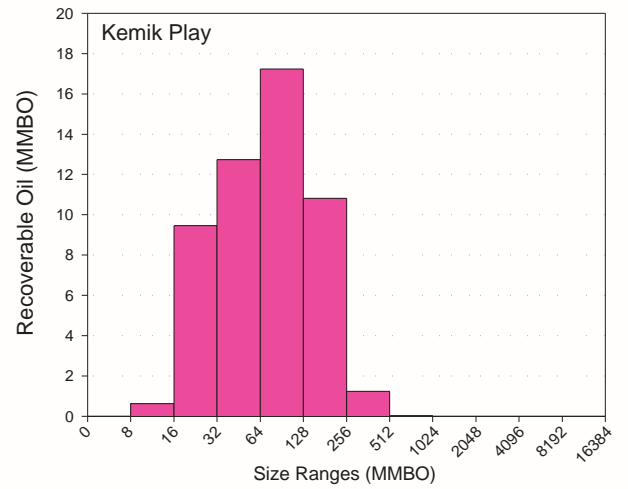
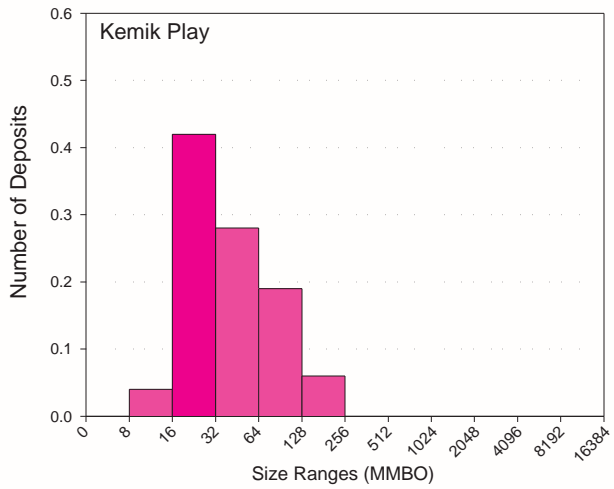
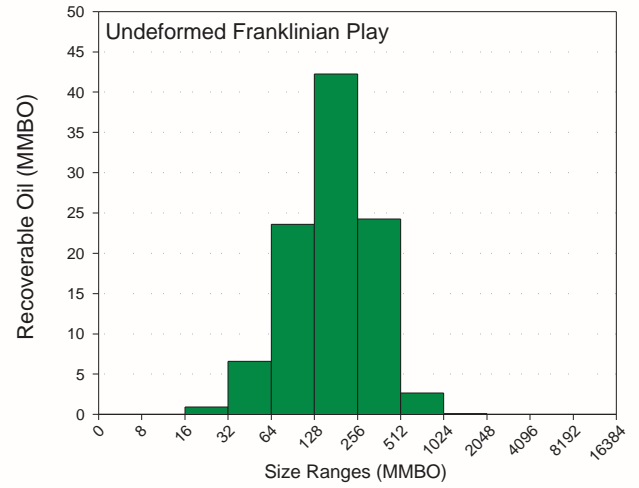
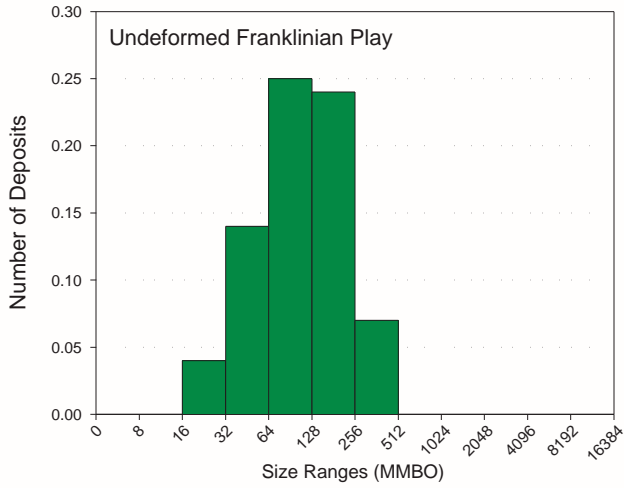


Figure RS2c. Number of deposits and volume of technically recoverable oil, given as distributions of recoverable resources. Plays are presented in descending order of total recoverable oil.

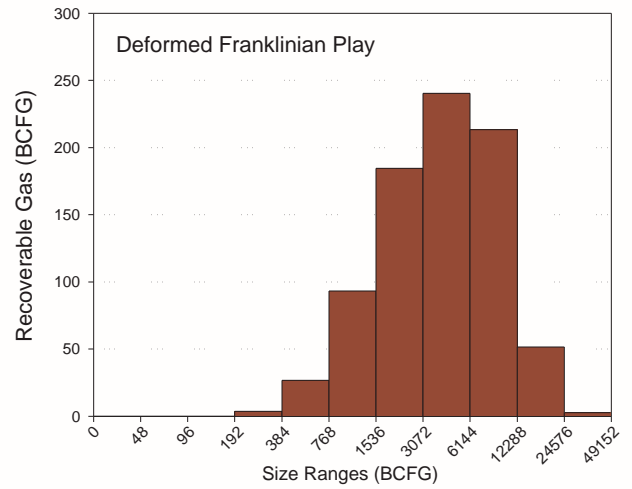
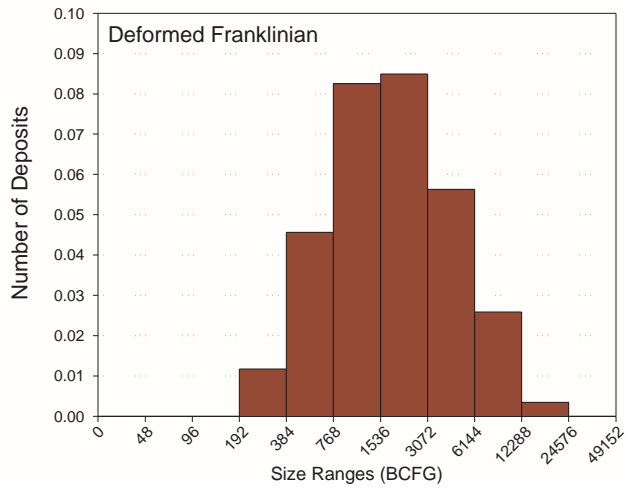
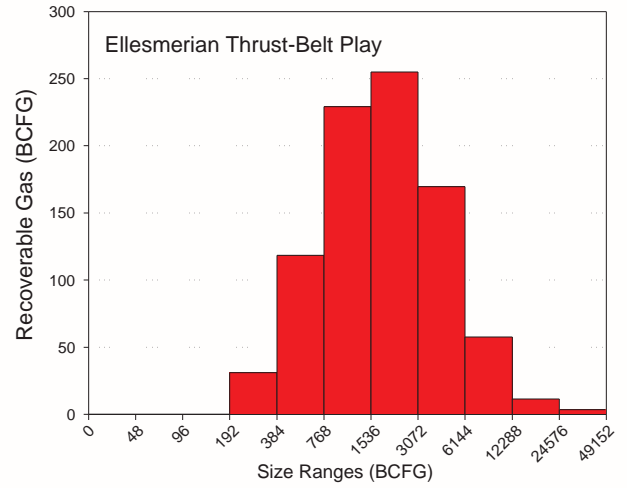
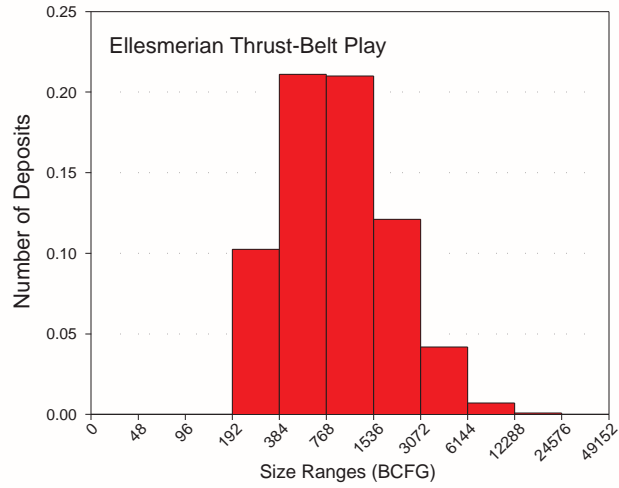


Figure RS2d. Number of deposits and volume of technically recoverable gas, given as distributions of recoverable resources.

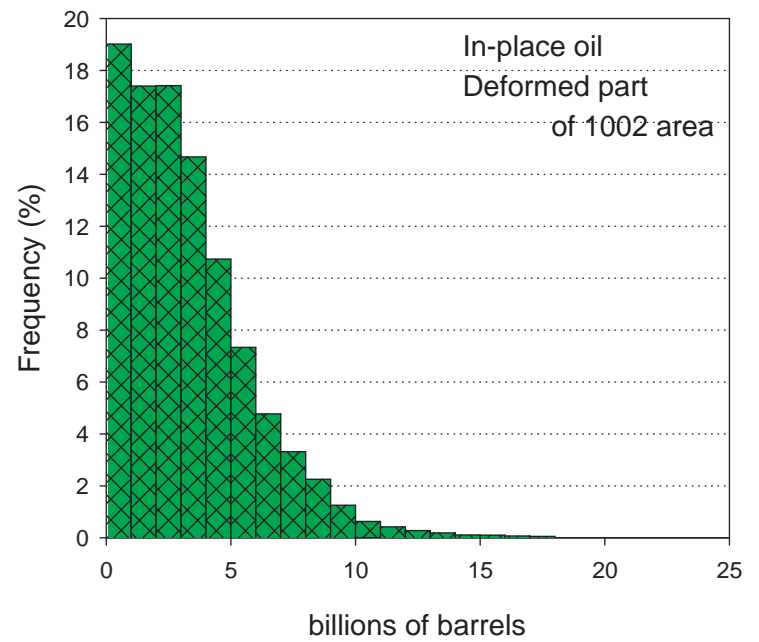
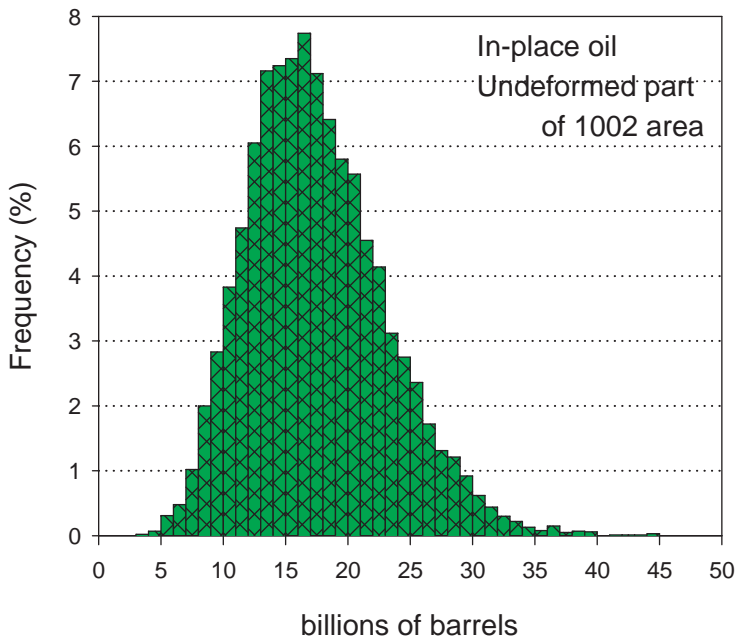
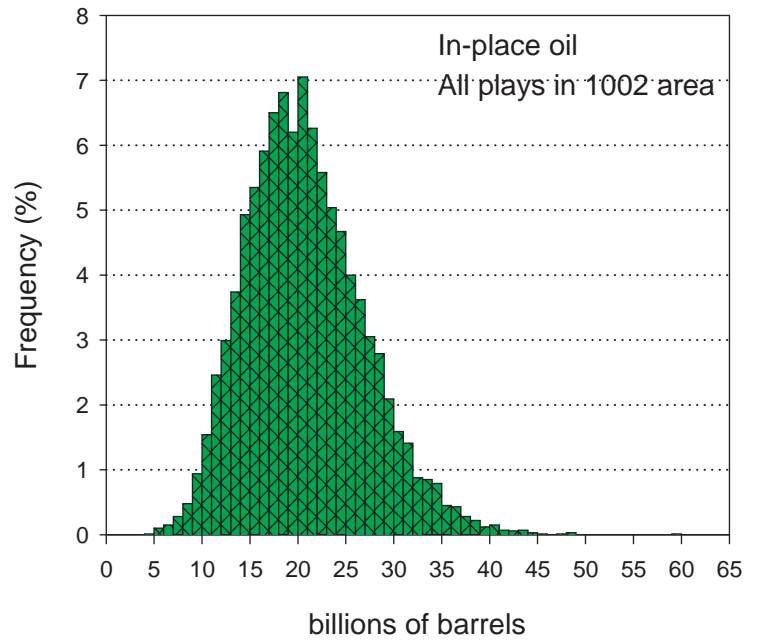
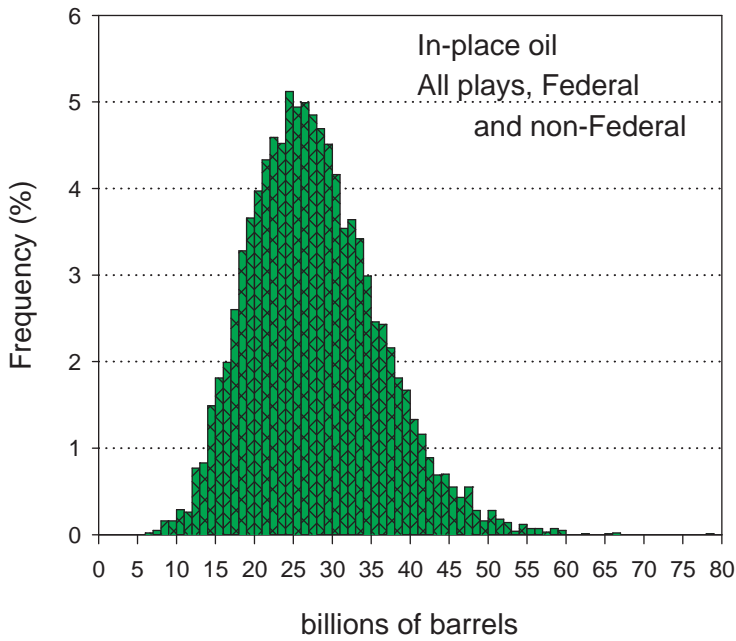


Figure RS3. Distributions of expected mean in-place oil, aggregated into four areas. The histogram for in-place oil in the 1002 area (upper right) is read as follows: the mean value of recoverable oil is expected to lie between 20 and 21 billion barrels with a probability of 7%, and to lie between 15 and 25 billion barrels with a probability of 60% (the sum of ten intervals).

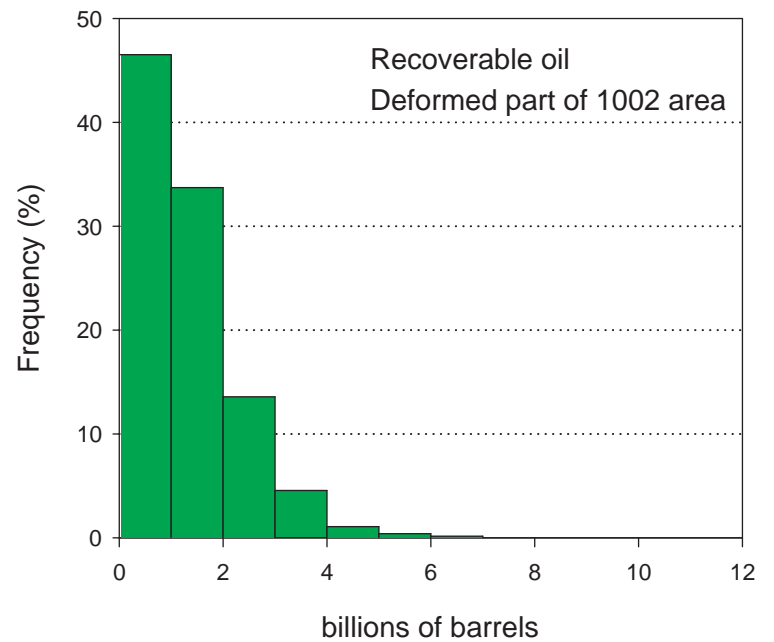
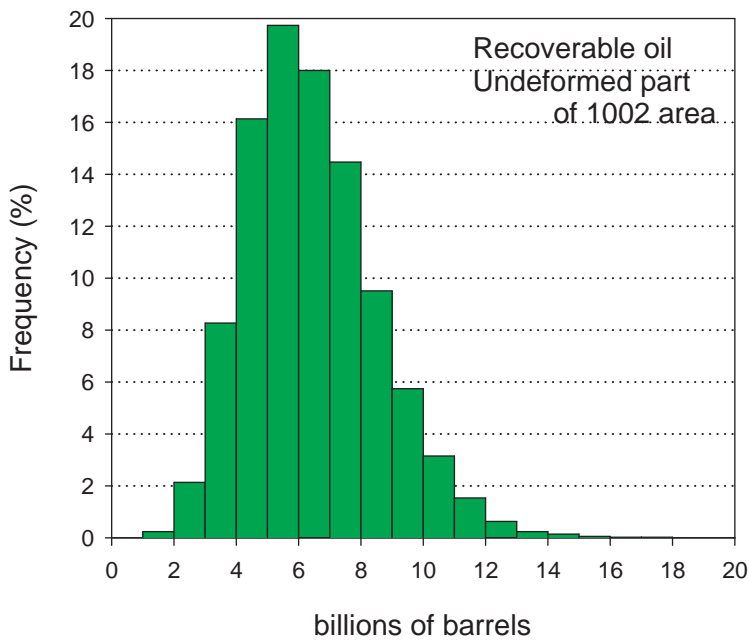
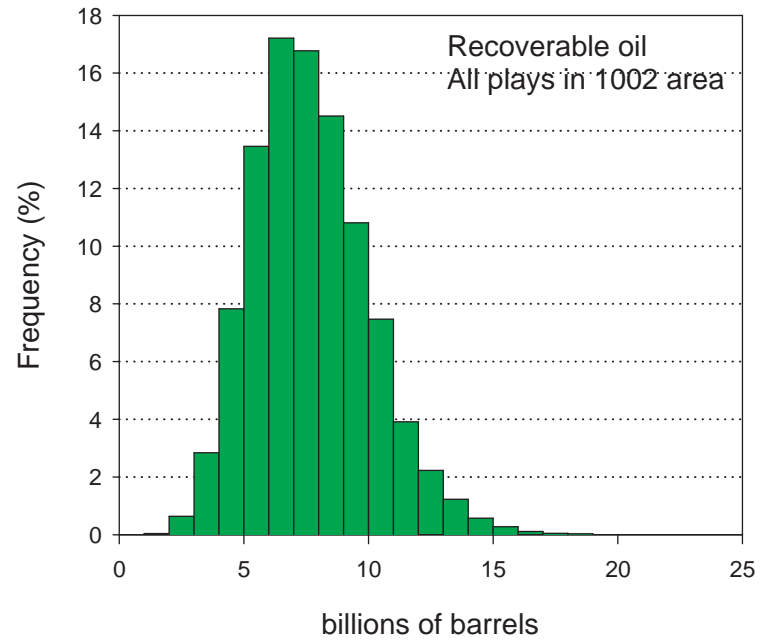
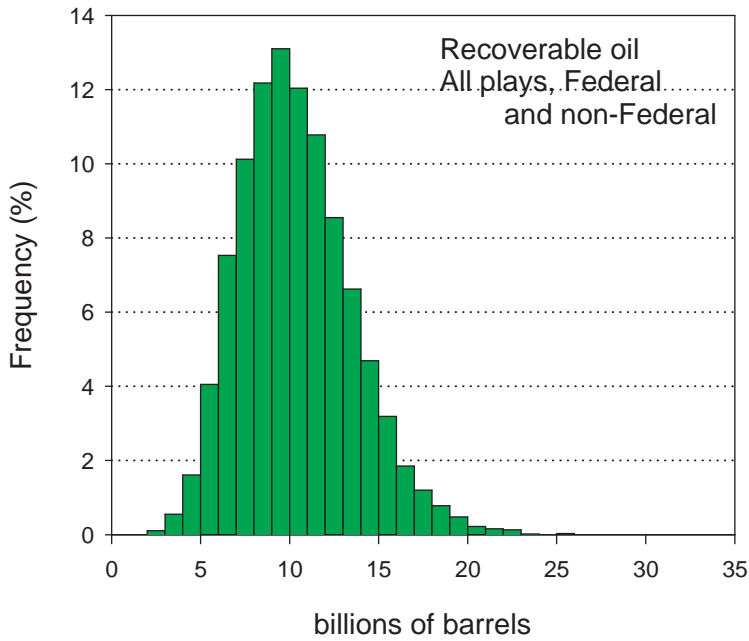


Figure RS4. Distributions of expected mean recoverable oil, aggregated into four areas. The histogram for recoverable oil in the 1002 area (upper right) is read as follows: the mean value of recoverable oil is expected to lie between 6 and 7 billion barrels with a probability of 17%, and to lie between 5 and 10 billion barrels with a probability of 73% (the sum of five intervals).

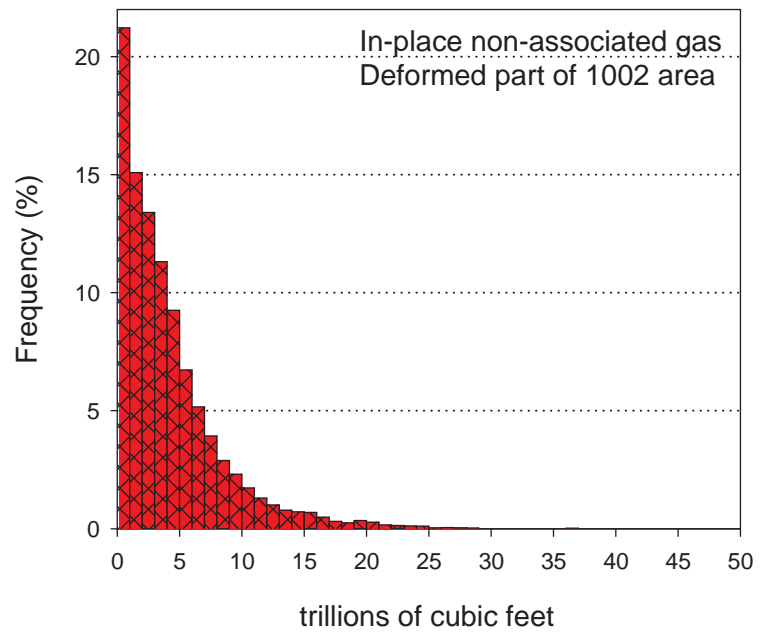
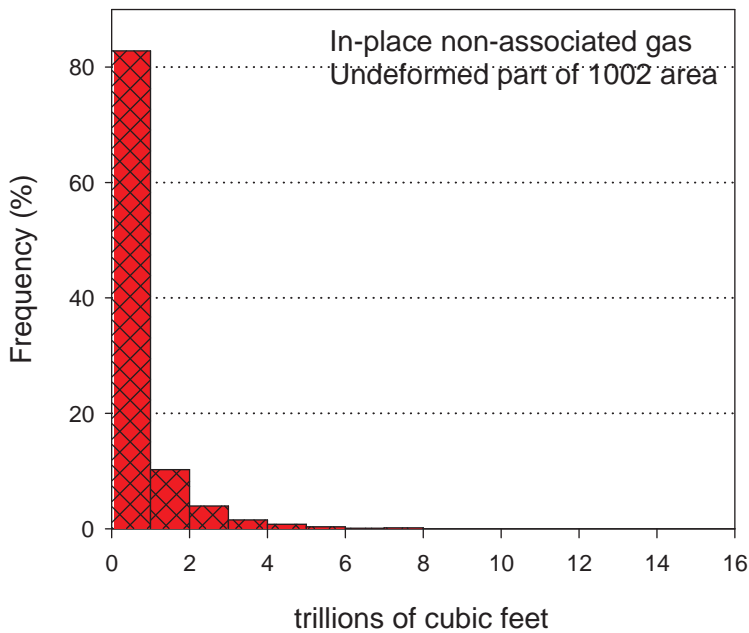
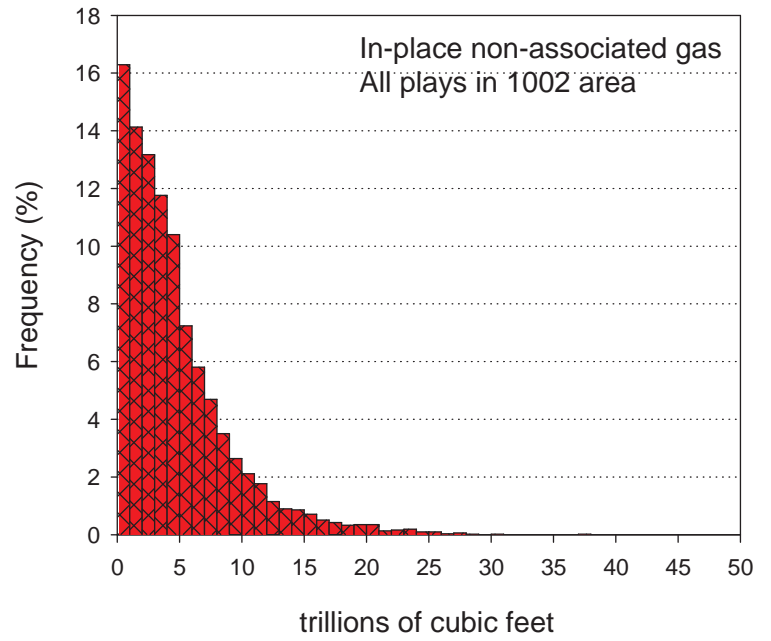
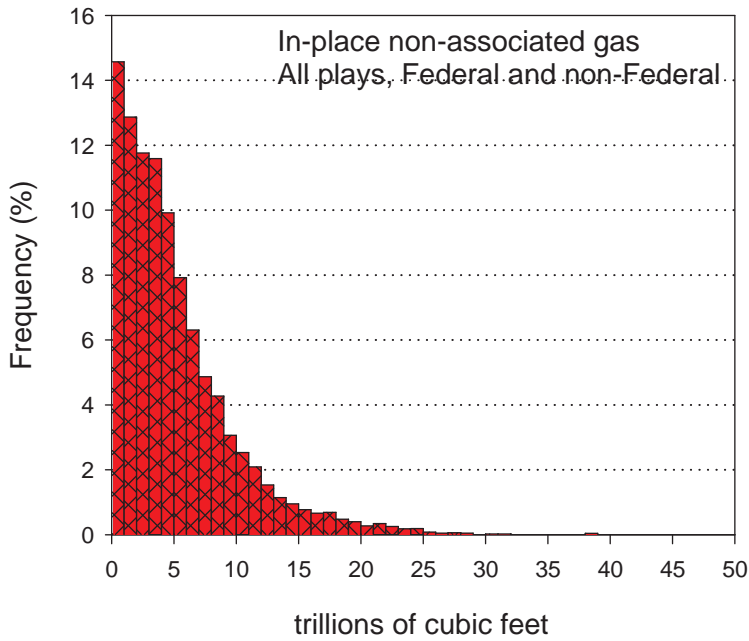


Figure RS5. Distributions of mean in-place non-associated gas, aggregated into four areas. The histogram for in-place gas in the 1002 area (upper right) is read as follows: the mean value of in-place gas is expected to lie between 0 and 1 trillion cubic feet with a probability of 16%, and to lie between 0 and 5 trillion cubic feet with a probability of 65% (the sum of five intervals).

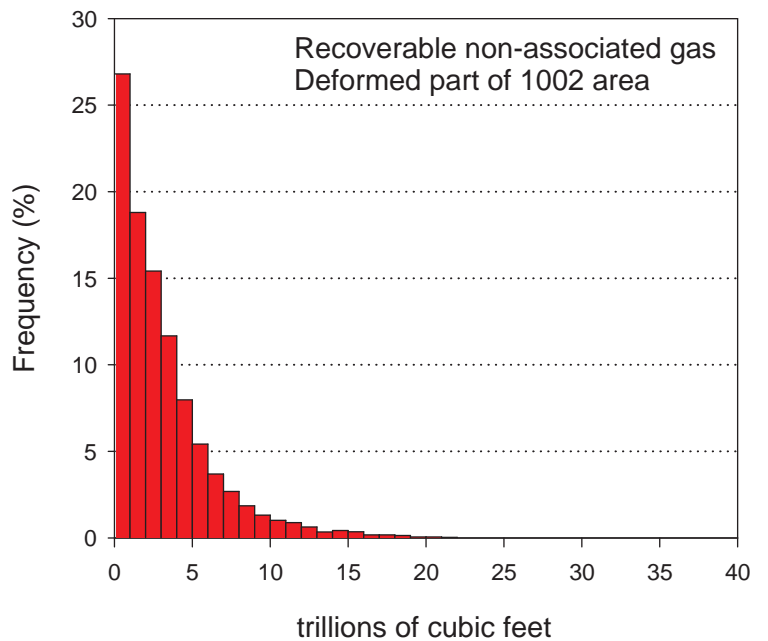
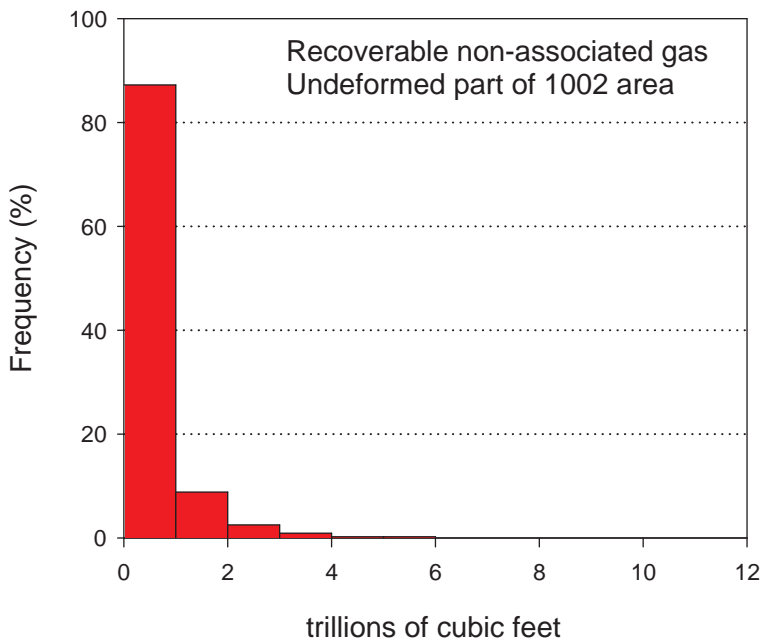
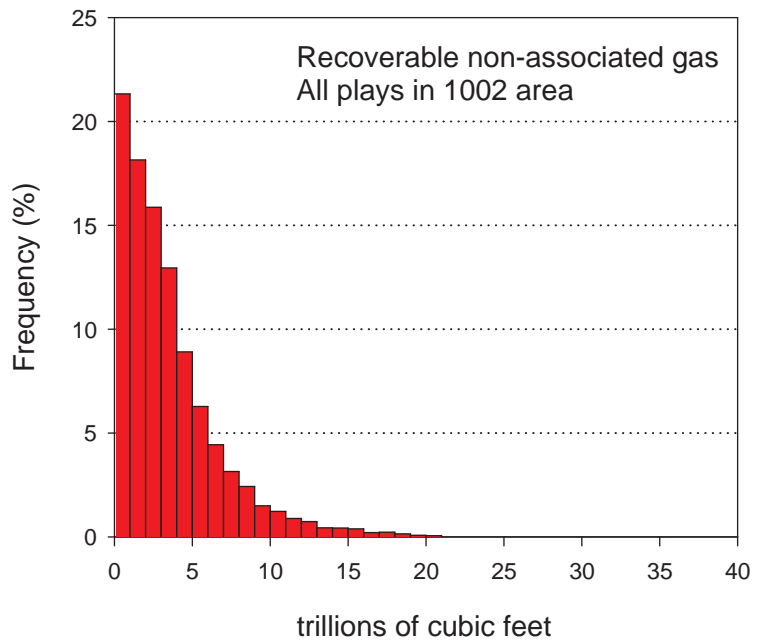
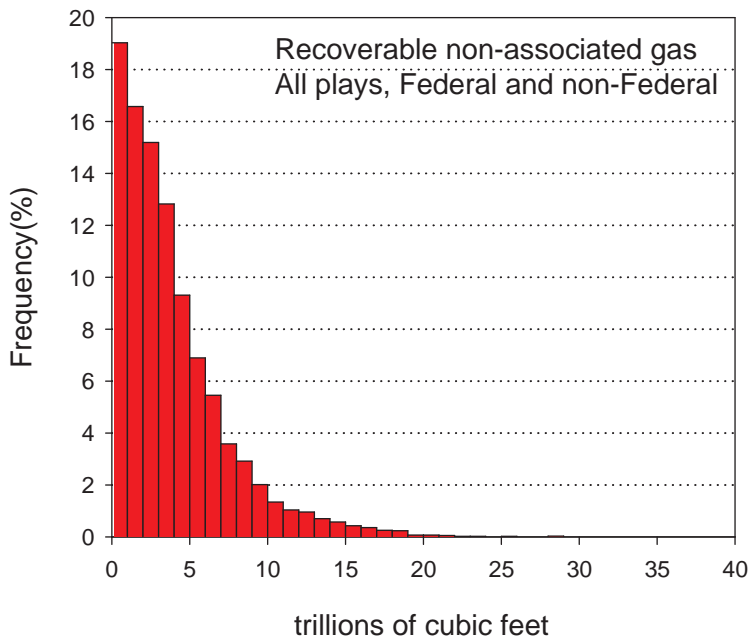


Figure RS6. Distributions of mean recoverable non-associated gas, aggregated into four areas. The histogram for gas in the 1002 area (upper right) is read as follows: the mean value of recoverable gas is expected to lie between 0 and 1 trillion cubic feet with a probability of 22%, and to lie between 0 and 5 trillion cubic feet with a probability of 77% (the sum of five intervals).