UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Assessment of conventionally recoverable petroleum resources of northeastern Mexico

by

Charles D. Masters and James A. Peterson

Open-File Report 81-1143

1981

Assessment of conventionally recoverable petroleum resources of northeastern Mexico

by

Charles D. Masters and James A. Peterson

PREFACE

The following preliminary report is a product of the World Energy Resources Program of the U.S. Geological Survey (USGS). The program is designed to prepare geologically based resource assessments of the potential petroleum basins of the world. Initial investigations of the program focus on the major petroleum-producing regions of the world with the objective of acquiring a critical, unbiased perspective on the resource potential of a field, a basin, and ultimately a country as a whole. In selected areas, follow-on studies to analyze production potential are conducted by U.S. Department of Energy (DOE) petroleum engineers, and the combined results are incorporated in a report for the Foreign Energy Supply Assessment Program (FESAP) of the DOE and the USGS. This USGS Open-File Report includes only the preliminary assessment with some minimal backup data and comments relevant to the assessment.

INTRODUCTION

The locations of the northeastern Mexico basins are shown in figure 1. Unconditional estimates by the USGS of oil and gas resources in these basins are given in table 1 and figures 2 and 3. Data supporting these estimates are supplied in table 2.

ACKNOWLEDGEMENT

The resource assessment for this report was prepared under the guidance of the Resource Appraisal Group of the Branch of Oil and Gas Resources. The geologic investigation leading to the assessment was conducted by James A. Peterson.

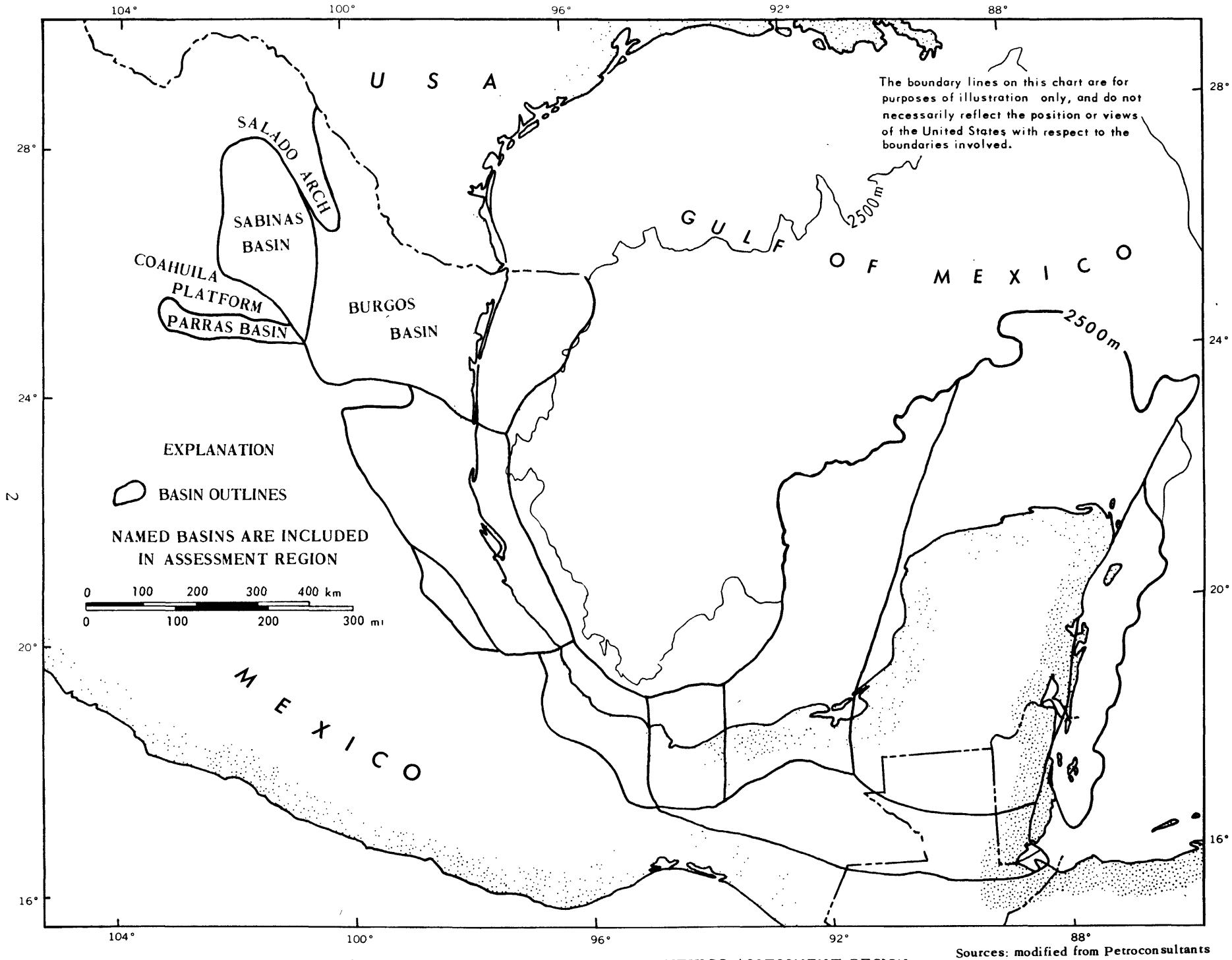


Fig. 1. LOCATION OF NORTHEASTERN MEXICO ASSESSMENT REGION

Sources: modified from Petroconsultants & from USGS MF-1044A (1978).

Table 1.--Assessment of conventionally recoverable petroleum resources of northeastern Mexico, including the Sabinas, Parras, and Burgos basins

Unconditional resource assessment by USGS as of 6/23/81; see also figures 2 and 3.

	Crude Oil in Billions of Barrels (BB)			Natural Gas in Trillions of Cubic Feet (Tcf) and Billions of Barrels of Oil Equivalent (BBOE) @ 6,000 cuft/bbl.[1/]				
Probability of occurrence in %	95%	5%	Mean		95%	5%	Mean	
1. Sabinas and Parras basins[2/]								
Estimate:	0	2.9	0.8		18	122	55	
2. Burgos basin								
Estimate:	0.1	1.2	0.5		1.6	12.5	5.5	
3. Combined Sabinas, Parras, and Burgos basins:[3/]								
Estimate:	0.2	3.5	1.3	Tcf	23	126	61	
				BBOE	4	21	10	

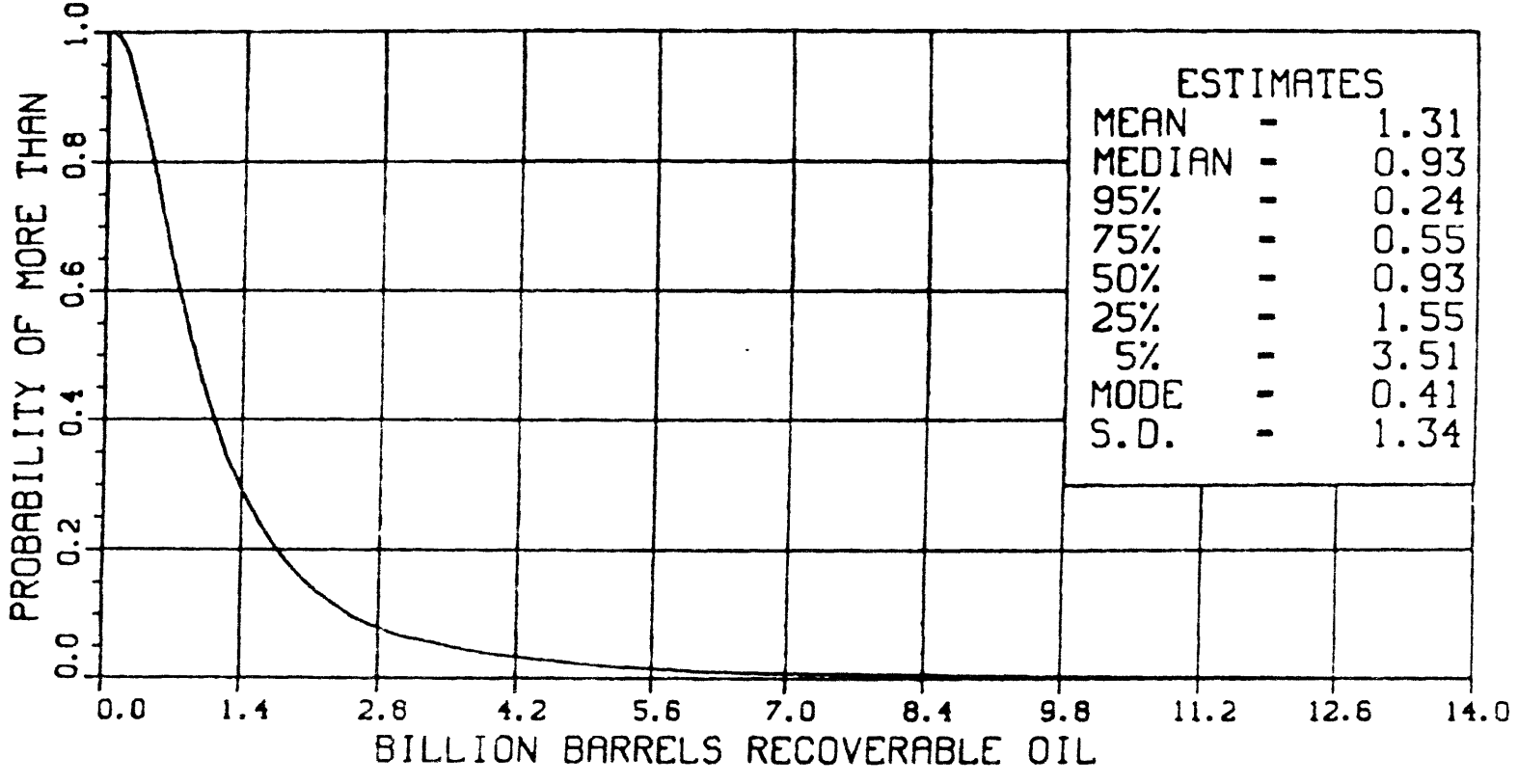
1/ In PEMEX reports, conversion to BBOE is made at 5,000 cuft/bbl, but the 6,000/1 conversion is used here for comparison with other U.S. and World numbers.

2/ A marginal probability of .85 is assigned to the occurrence of commercial oil in these basins.

3/ Totals are derived by statistical aggregation; only the mean total equals the sum of the component parts.

UNCOND ** OR **

Figure 2.--BURGOS/SABINAS-PARRAS B. N. MEXICO AGG. REC. OIL 06/23/81



UNCOND ** OR **

Figure 3.--BURGOS/SABINAS-PARRAS B. N. MEXICO AGG. REC. TOTAL GAS 06/23/81

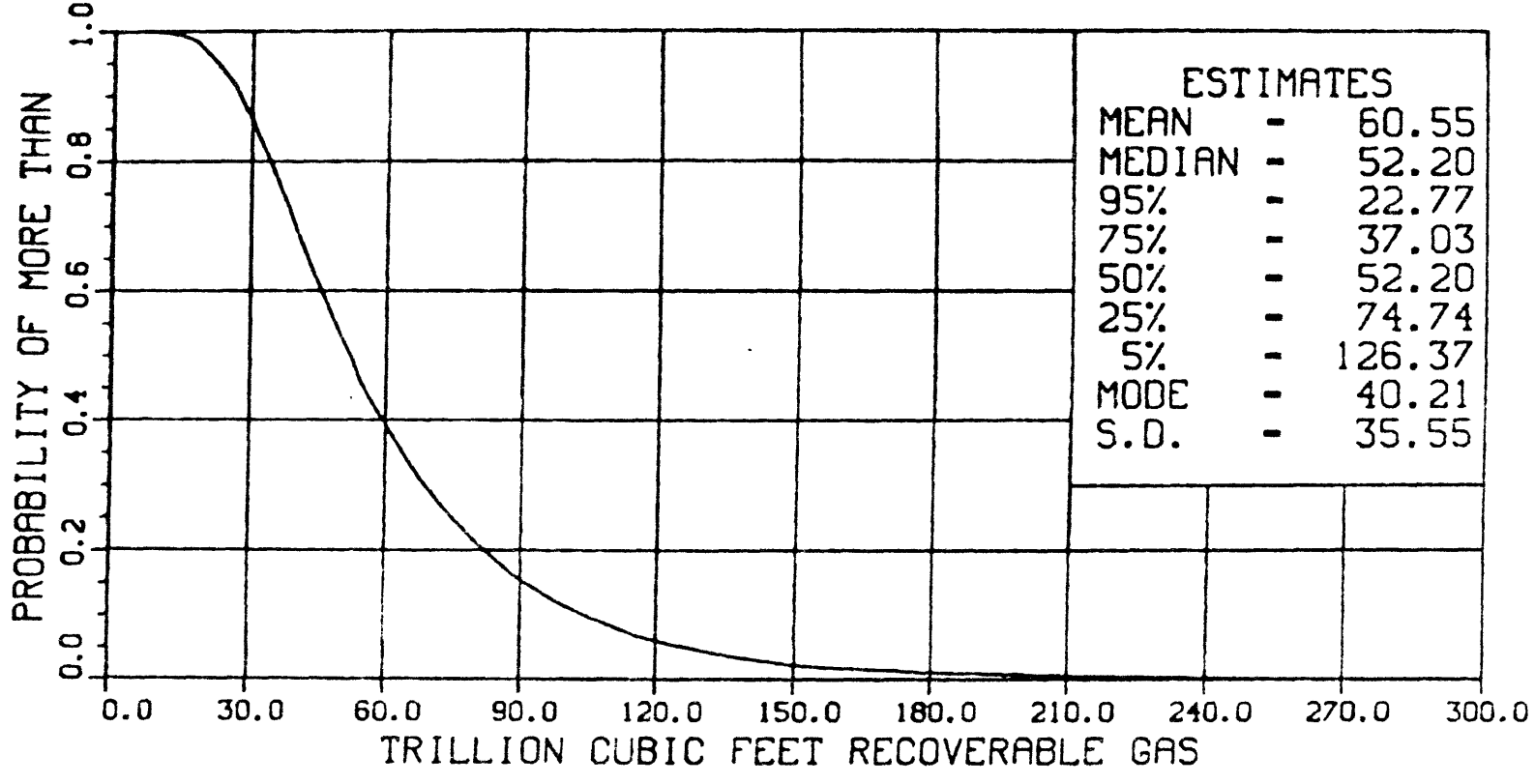


Table 2.--Supplementary and comparative data supporting the resource assessment for northeastern Mexico[1/]

	Crude Oil (BB)	Natural Gas (Tcf)
1. Cumulative production to 1/1/80		
Sabinas/Parras	0	+[2/]
Burgos	0.1	4.0
2. Measured reserves [3/] to 1/1/80		
Sabinas/Parras	0	+[2/]
Burgos	0.3	5.0

3. Original recoverable resources (ultimate) of the two basins

	Oil	Gas (BBOE)
Cumulative production	0.1	4.0+
Identified reserves	0.3	5.0+
Undiscovered resources (mean)	1.3	61.0
	1.7	70.0+
	BBOE	12+

Total 14+ BBOE

[1/] Cumulative production and reserves are composited estimates from various sources.

[2/] Quantity positive but data unavailable.

[3/] Follows terminology outlined in USGS Circular 831.

COMMENTS

- Exploration in the Sabinas basin is in its very initial stages. So far, we have reports on four successful wildcats, each of which is reported to be capable of production in excess of 10,000,000 cuft/day. Though no oil has yet been reported, the geologic investigation suggests that oil in some part of the basin is likely.

- Giant fields are likely in the Sabinas and Parras basins owing to structural development, including salt and probable favorable Jurassic source rock. Overall stratigraphic thickness of Mesozoic units may be 30,000-40,000 feet.

- The Sabinas and Parras basins reflect geologic conditions similar to those in the western United States from the overthrust belt east to the craton. Production from Jurassic and Cretaceous units will predominate.

- The Burgos basin is an extension of the U.S. Western Gulf basin. Substantial production has been established from lower Tertiary rocks on both sides of the U.S.-Mexico border. Production from Eocene and Oligocene rocks will predominate.

- Giant fields are not likely in the Burgos basin owing to the state of maturity for exploration and the deltaic environment. Overall stratigraphic thickness of Tertiary rocks may exceed 40,000 feet.