UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

Assessment of conventionally recoverable petroleum resources of Indonesia

by

Charles D. Masters and Joseph P. Riva, Jr.

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PREFACE

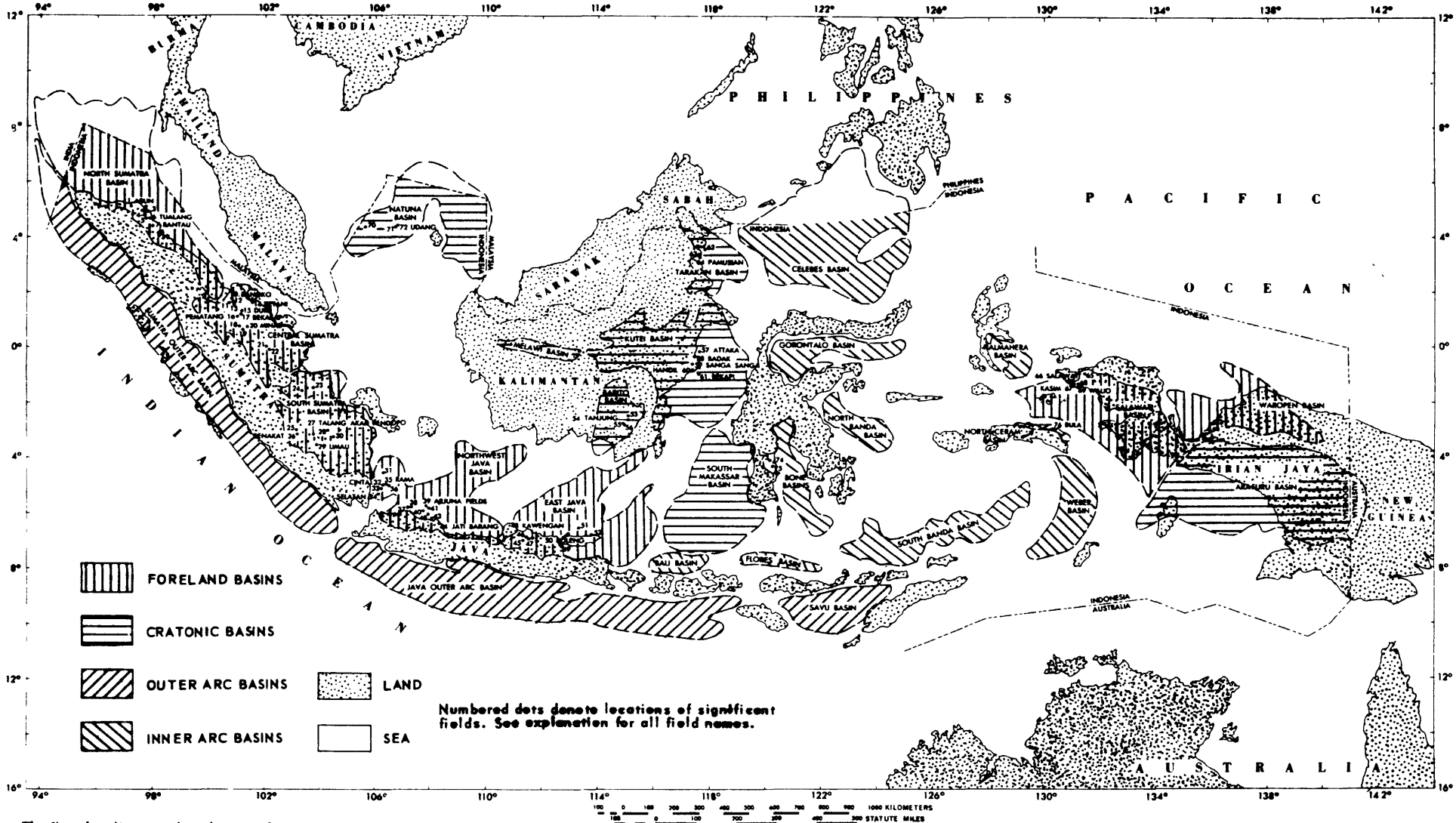
The following preliminary report is a product of the World Energy Resources Program of the U.S. Geological Survey (USGS). The program is designed to prepare geologically based resource assessments of the potential petroleum basins of the world. Initial investigations of the program focus on the major 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 and some minimal backup data and comments relevant to the assessment.

INTRODUCTION

The locations of the Indonesian 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 Joseph P. Riva, Jr.



The boundary lines on this chart are for purposes of illustration only, and do not necessarily reflect the position or views of the United States with respect to the boundaries involved.

Fig. 1. **MAP OF SEDIMENTARY BASINS AND MAJOR OIL AND GAS FIELDS OF THE INDONESIAN REGION**

LOCATION OF INDONESIA ASSESSMENT REGION

EXPLANATION
showing names of fields numbered on figure 1

North Sumatra basin fields

1. Arun
2. Djulu Rajeu
3. Perkal
4. Guedongdong
5. Alur Tjimon
6. Tualang
7. Rantau
8. Telaga Said
9. Darat

Central Sumatra basin fields

10. Bangko
11. Balam
12. Sintong
13. Menggala
14. Petani
15. Duri
16. Pematang
17. Bekasap
18. Petapahan
19. Kotabatak
20. Minas
21. Pulai
22. Sago

South Sumatra basin fields

23. Tempino
24. Bedjubang
25. Djirak
26. Benakat
27. Talang Akar Pendopo
28. Abab
29. Limau
30. Djimar

Northwest Java basin fields

31. Krisna
32. Cinta
33. Kitty
34. Selatan
35. Rama
36. Nora
37. MX
38. MY
39. Arjuna Fields
40. Arjuna Fields
41. Arjuna Fields
42. Arjuna Fields
43. Arjuna Fields
44. Jatibarang

East Java basin fields

45. Semanggi
46. Nglobo
47. Ledok
48. Kawengan
49. Kruka
50. Poleng
51. JS Well
52. JS Well

Barito basin fields

53. Kambitin
54. Tanjung
55. Tanta
56. Warukin South

Kutei basin fields

57. Attaka
58. Badak
59. Sanga Sanga
60. Handil
61. Bekapi

Tarakan basin fields

62. Bunyu
63. Mengatal
64. Pamusian

Salawati basin fields

65. Kalmono
66. Salawati
67. Kasim
68. Jaya
69. Walio

Natuna basin fields

70. Terubuk
71. East Udang
72. Udang

Bone basin fields

73. Kampung Baru
74. Bonge
75. Walanga

North Ceram basin field

76. Bula

Table 1.--Assessment of conventionally recoverable petroleum resources of Indonesia

Unconditional resource assessment by USGS as of 6/25/81; 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.			
Probability of occurrence in %	95%	5%	Mean		95%	5%	Mean
Estimate	5	35	16	Tcf	13	94	42
				BBOE	2	16	7

Figure 2.--INDONESIA REC. OIL 06/25/81

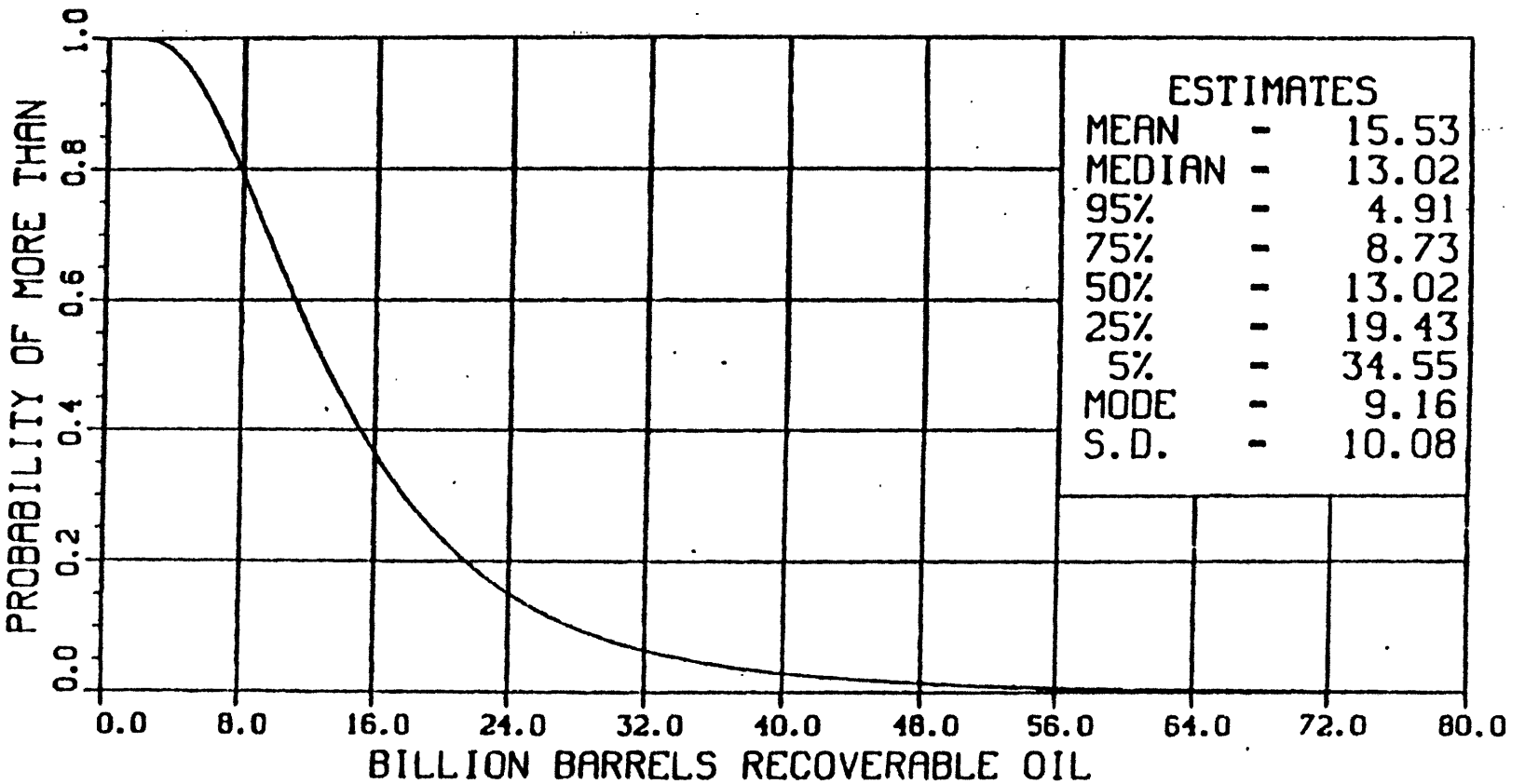


Figure 3.--INDONESIA REC. TOTAL GAS 06/25/81

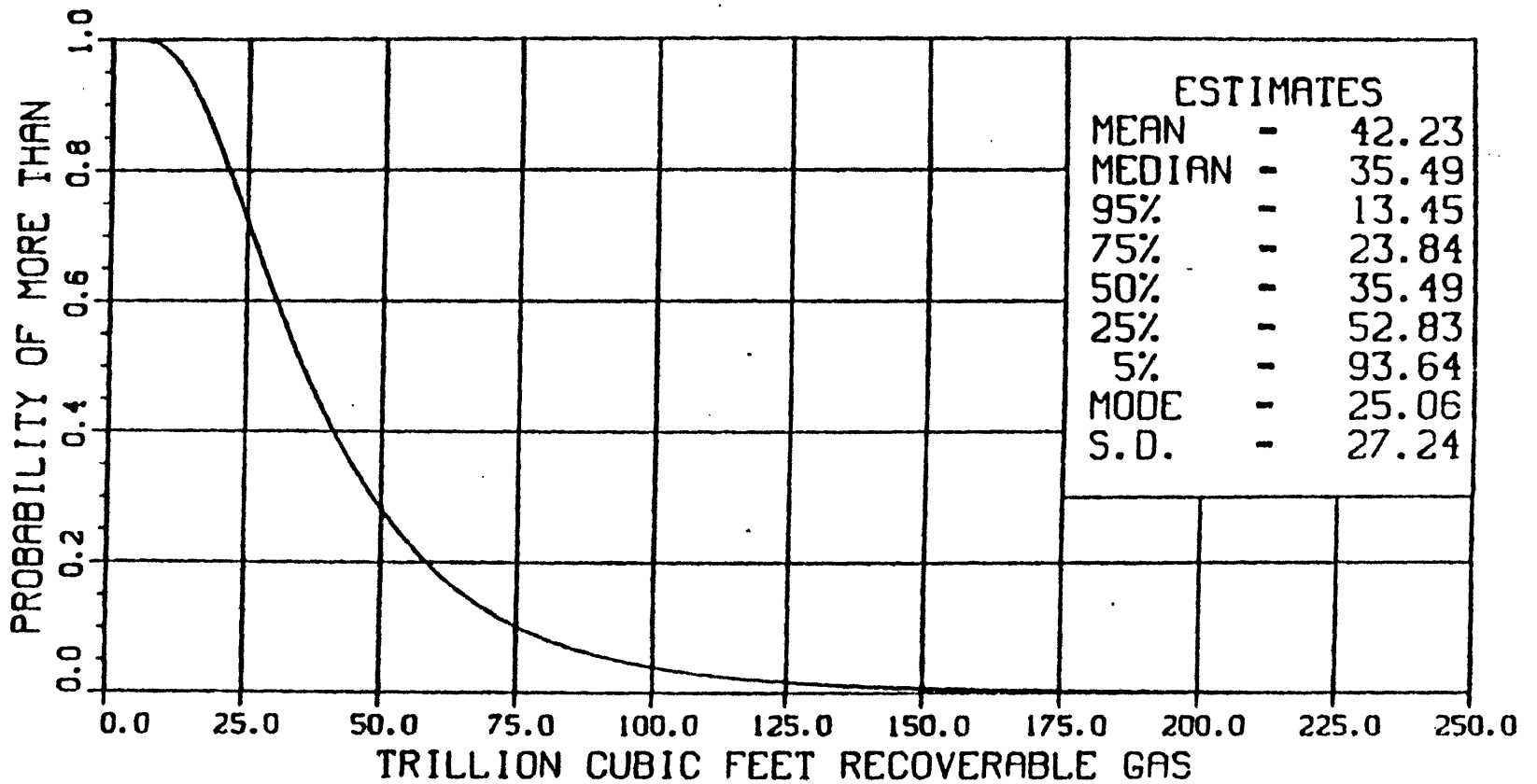


Table 2.--Supplementary and comparative data supporting this resource assessment of Indonesia[1/]

	Crude Oil (BB)	Natural Gas (Tcf)
1. Cumulative production to 1/1/80		
	8.7	.6+[2/]
2. Identified reserves to 1/1/80[3/]		
Demonstrated	4.9	20.7
Inferred	3.1	+[2/]
	8.0	20.7
3. Original recoverable resources (ultimate) of Indonesia		
Cumulative	8.7	.6+
Identified reserves	8.0	20.7+
Undiscovered resources (mean)	16.0	42.0
	32.7	63.3+
		BBOE 11+

Total 44+ BBOE

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

[2/] Quantity positive or likely understated; data unavailable.

[3/] Follows terminology outlined in USGS Circular 831. Demonstrated is equivalent to API Proved plus Indicated Additions. Inferred represents anticipated reserves growth in existing fields.

COMMENTS

- The potential petroleum basins of Indonesia can be divided into four geologic types: foreland, cratonic, outer arc and inner arc basins. Basins that appear to be an extension of the Australian Craton are not included in this assessment.

- The foreland and cratonic basins comprise all the present reserves and production and have significantly greater potential than do the outer arc and inner arc basins. The latter two basin types likely will yield only small discoveries, but isolated reefs could yield high flow rates; significant parts of these basins lie in water depths in excess of 1,000 meters.

- Considering that the foreland basins are more extensively explored, we estimate that at least 60 percent of the undiscovered potential for oil lies in cratonic basins; for gas, as much as 80 percent of the undiscovered potential should be assigned to cratonic basins owing to considerations of basin history. Since the assessment was made (6/25/81) an unconfirmed report has suggested the possibility of a giant gas discovery in the northern part of West Natuna basin; if true, our estimate may need adjustment.

- Of the basins being actively explored, Kutei and East and West Natuna basins hold the greatest potential. Arafuru (or New Guinea foreland basin) is the most prospective of the frontier basins.

- Oil is found in marine and nonmarine rocks and in a wide variety of rock types; all occurrences, however, are paraffin based and have low sulfur contents. The occurrence in the North Sumatra basin of a giant gas field (Arun, original reserves of 13.7 Tcf) in a platform carbonate at approximately 3,000 m drilling depth is probably owing to the temperature conversion of oil to gas.