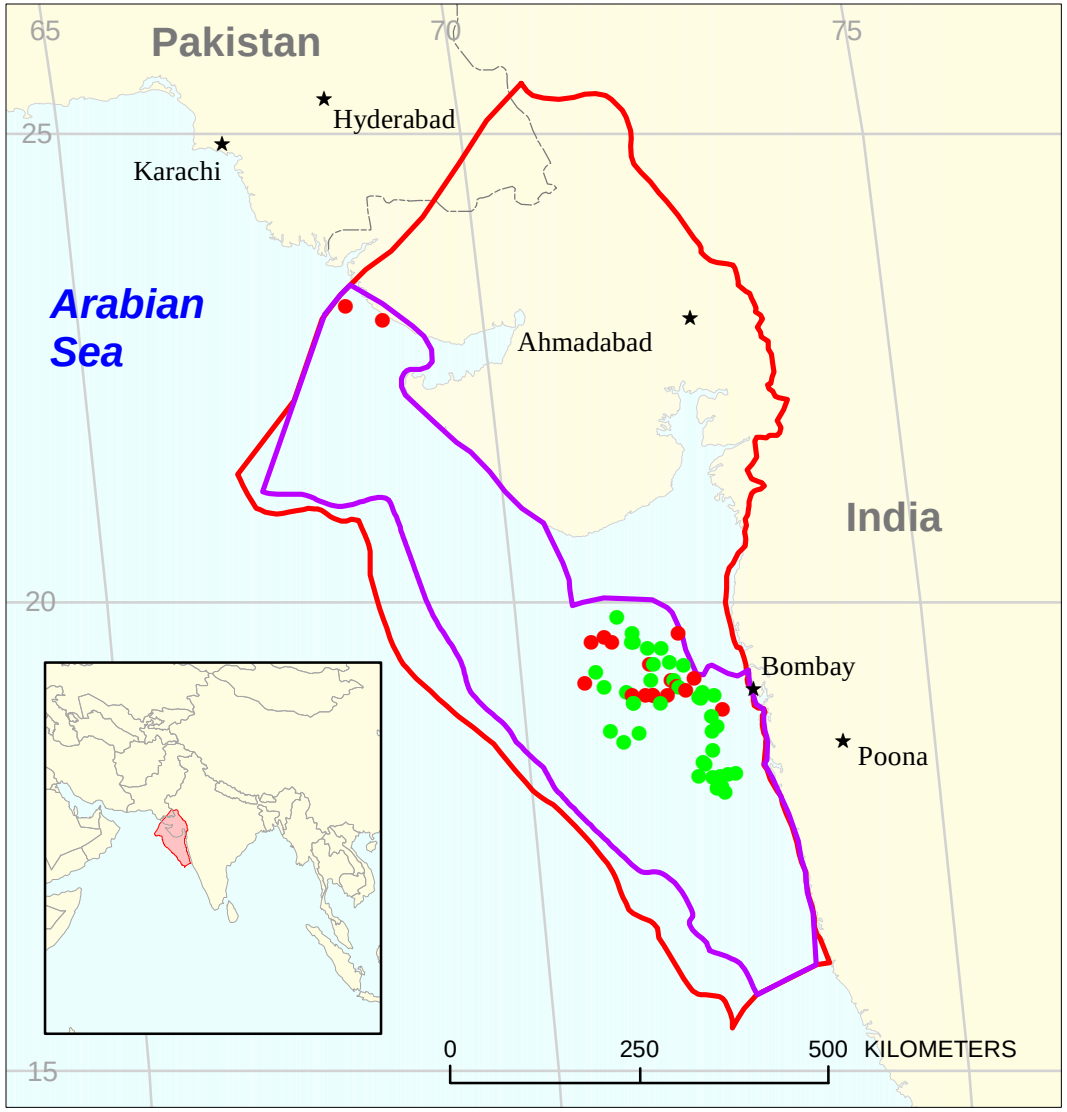
Go to Table of Contents

Go to index map

Eocene-Miocene Bombay Shelf Assessment Unit 80430101



Eocene-Miocene Bombay Shelf Assessment Unit 80430101

Bombay Geologic Province 8043

Geologic Summary

Detailed map of this assessment unit

Exploration/Discovery-History Data

- Plots of Known Field Sizes
- Plots of Grown Resources
- Tables

Assessment Input Data

Assessment Results

- Assessment Unit Summary
- Detailed Assessment Results
- Undiscovered Field-Size Distributions

USGS PROVINCE: Bombay (8043) India **GEOLOGIST:** C.J. Wandrey

TOTAL PETROLEUM SYSTEMS: Eocene-Miocene Composite (804301)

ASSESSMENT UNIT: Eocene-Miocene Bombay Shelf (80430101)

DESCRIPTION: This oil prone assessment unit is located offshore along the west coast of India. A pericratonic basin, it is characterized by extensive carbonate platform shelf development during Middle Eocene to Middle Miocene. The carbonates reached their maximum extent in late Oligocene covering much of the shelf from the Indus River Delta south.

SOURCE ROCKS: Thick deltaic clay and shale facies deposited in the Surat and Dahanu depressions and the shelf margin basin during the Eocene through early Miocene are the most likely source rocks. The shelf margin basin, Saurashtra and Kutch offshore areas, with less source rock has less potential. Kerogens are primarily terrestrial types II and III. Eocene through early Miocene shales in the Bombay offshore area have TOC values from 0.5 to 2.0 percent and higher for Eocene shales in the Dahanu depression

MATURATION: Thermal alteration index (TAI) values of 3 or higher reported for early Miocene and older rocks and vitrinite reflectance (Ro) values of 0.4 to1.1 percent indicate temperatures were sufficiently high to generate oil and gas.

GENERATION AND MIGRATION: Burial history data indicate generation occurred during the Pliocene. Migration is primarily updip. Because shales on the carbonate platforms of the Bombay High and Ratnagiri Shelf are generally immature, it is likely that oil and gas migrated from early Miocene and older shales of the Surat and Dahanu depressions.

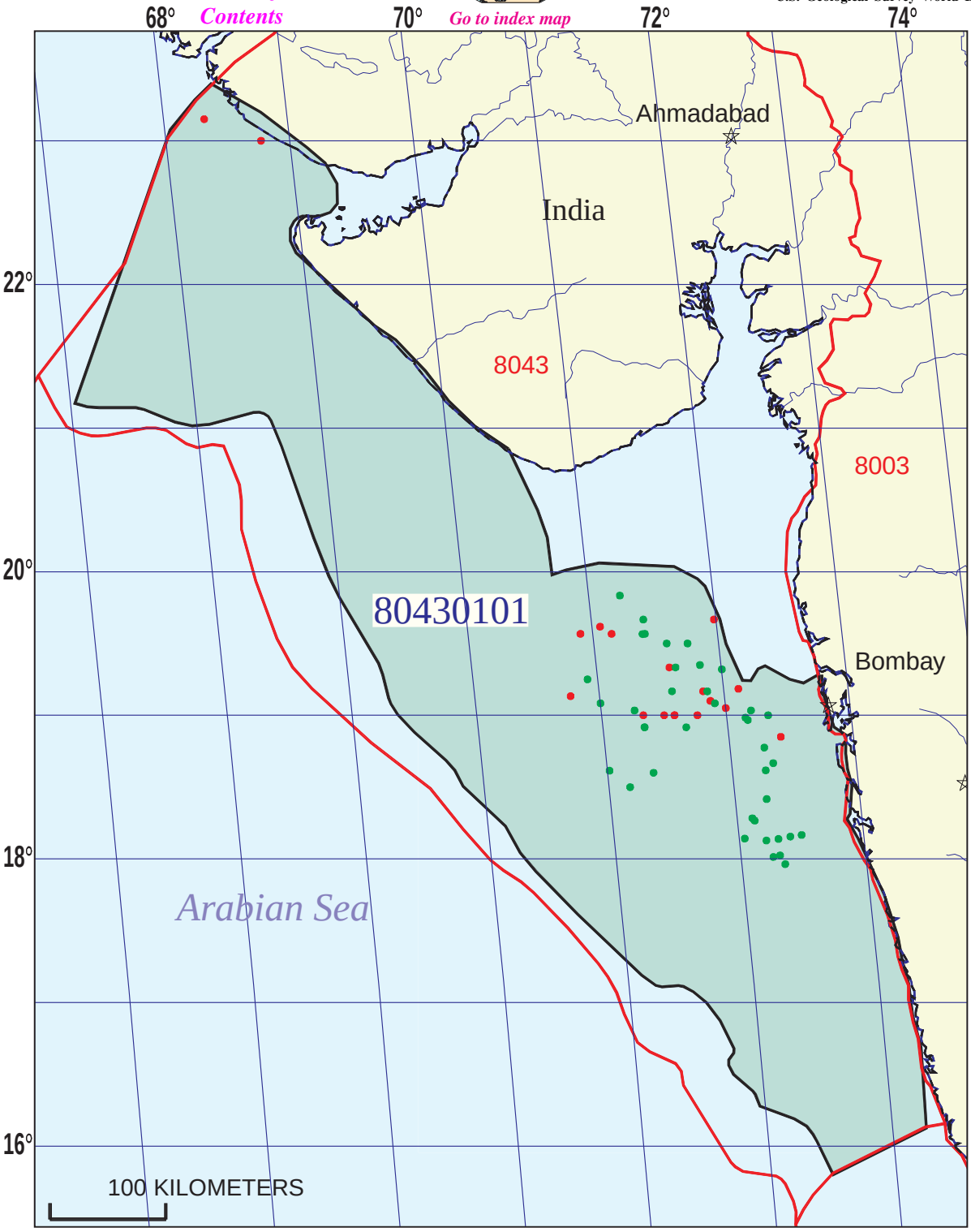
RESERVOIR ROCKS: Oil and gas is produced from fractured basement through middle Miocene reservoirs with the most prolific being the platform carbonates such as the early Miocene L-III Limestone. Other significant reservoirs are the Miocene L-II Limestone, L-I Limestone, S-Sandstone, Eocene Bassein Limestone, and Eocene Panna Sandstone.

TRAPS AND SEALS: Discoveries to date are anticlines and faulted anticlines revealed by seismic surveys. The most prolific traps are located on paleo-highs developed in the Late Cretaceous or early Paleocene as a result of rifting. The most likely seal is a series of thick middle to late Miocene shales extending over the area.

REFERENCES:

Das, N.C., Saxena, P.K., Singh, S.P., and Kumar, R.K., 1987, Influence of terrestrial source material on the composition of crude oils of Bombay Offshore basin, India, *in* Kumar, R.K. and others eds, Petroleum geochemistry and exploration in the Afro-Asian region: Rotterdam, Balkema, p. 393-399.

Singh, Dhruvendra, Srivastava, D.K., Gupta, V.P., and Singh, N.P., 1995, Thermal maturation modeling, hydrocarbon generation and hydrocarbon prospect in Gulf of Cambay, Cambay basin, India, *in* Proceedings of the first international petroleum conference and exhibition, Petrotech-95, Volume 2: Delhi, B.R. Publishing, p. 171-182.



Eocene-Miocene Bombay Shelf Assessment Unit - 80430101

EXPLANATION

- Hydrography
- Shoreline
- 8043 Geologic province code and boundary
- Country boundary
- Gas field centerpoint
- Oil field centerpoint
- 80430101 Assessment unit code and boundary

Projection: Robinson. Central meridian: 0

SEVENTH APPROXIMATION
NEW MILLENNIUM WORLD PETROLEUM ASSESSMENT
DATA FORM FOR CONVENTIONAL ASSESSMENT UNITS

Date:……..	8/19/99		
Assessment Geologist:……..	C.J. Wandrey		
Region:……..	South Asia	Number:	8
Province:……..	Bombay	Number:	8043
Priority or Boutique……	Priority		
Total Petroleum System:……	Eocene-Miocene Composite	Number:	804301
Assessment Unit:……	Eocene-Miocene Bombay Shelf	Number:	80430101
* Notes from Assessor	Lower 48-all growth function.		

CHARACTERISTICS OF ASSESSMENT UNIT

Oil (<20,000 cfg/bo overall) **or** Gas (≥20,000 cfg/bo overall):… Oil

What is the minimum field size?……. 1 mmboe grown (≥1mmboe)
(the smallest field that has potential to be added to reserves in the next 30 years)

Number of discovered fields exceeding minimum size:…… Oil: 37 Gas: 18
Established (>13 fields) X Frontier (1-13 fields) _____ Hypothetical (no fields) _____

Median size (grown) of discovered oil fields (mmboe):
1st 3rd 49.3 2nd 3rd 9 3rd 3rd 22.3
Median size (grown) of discovered gas fields (bcfg):
1st 3rd 75.3 2nd 3rd 97.2 3rd 3rd 351.2

Assessment-Unit Probabilities:

Attribute	Probability of occurrence (0-1.0)
1. **CHARGE:** Adequate petroleum charge for an undiscovered field ≥ minimum size……	1.0
2. **ROCKS:** Adequate reservoirs, traps, and seals for an undiscovered field ≥ minimum size……	1.0
3. **TIMING OF GEOLOGIC EVENTS:** Favorable timing for an undiscovered field ≥ minimum size	1.0

Assessment-Unit GEOLOGIC Probability (Product of 1, 2, and 3):…….. 1.0

4. **ACCESSIBILITY:** Adequate location to allow exploration for an undiscovered field ≥ minimum size…… 1.0

UNDISCOVERED FIELDS

Number of Undiscovered Fields: How many undiscovered fields exist that are ≥ minimum size?:
(uncertainty of fixed but unknown values)

Oil fields:……min. no. (>0)	7	median no.	80	max no.	160
Gas fields:……min. no. (>0)	5	median no.	45	max no.	100

Size of Undiscovered Fields: What are the anticipated sizes (**grown**) of the above fields?:
(variations in the sizes of undiscovered fields)

Oil in oil fields (mmbo)……min. size	1	median size	9	max. size	500
Gas in gas fields (bcfg):……min. size	6	median size	70	max. size	2000

Assessment Unit (name, no.)
Eocene-Miocene Bombay Shelf, 80430101

AVERAGE RATIOS FOR UNDISCOVERED FIELDS, TO ASSESS COPRODUCTS

(uncertainty of fixed but unknown values)

Oil Fields:	minimum	median	maximum
Gas/oil ratio (cfg/bo)……	1100	2200	3300
NGL/gas ratio (bngl/mmcfg)……	10	20	30

Gas fields:	minimum	median	maximum
Liquids/gas ratio (bngl/mmcfg)……	20	40	60
Oil/gas ratio (bo/mmcfg)……			

SELECTED ANCILLARY DATA FOR UNDISCOVERED FIELDS

(variations in the properties of undiscovered fields)

Oil Fields:	minimum	median	maximum
API gravity (degrees)……	28	38	48
Sulfur content of oil (%)……			
Drilling Depth (m) ……	500	2500	5000
Depth (m) of water (if applicable)……	0	100	1000

Gas Fields:	minimum	median	maximum
Inert gas content (%)……			
CO_2 content (%)……			
Hydrogen-sulfide content (%)……			
Drilling Depth (m)……	500	2500	5000
Depth (m) of water (if applicable)……	0	100	1000

Assessment Unit (name, no.)
Eocene-Miocene Bombay Shelf, 80430101

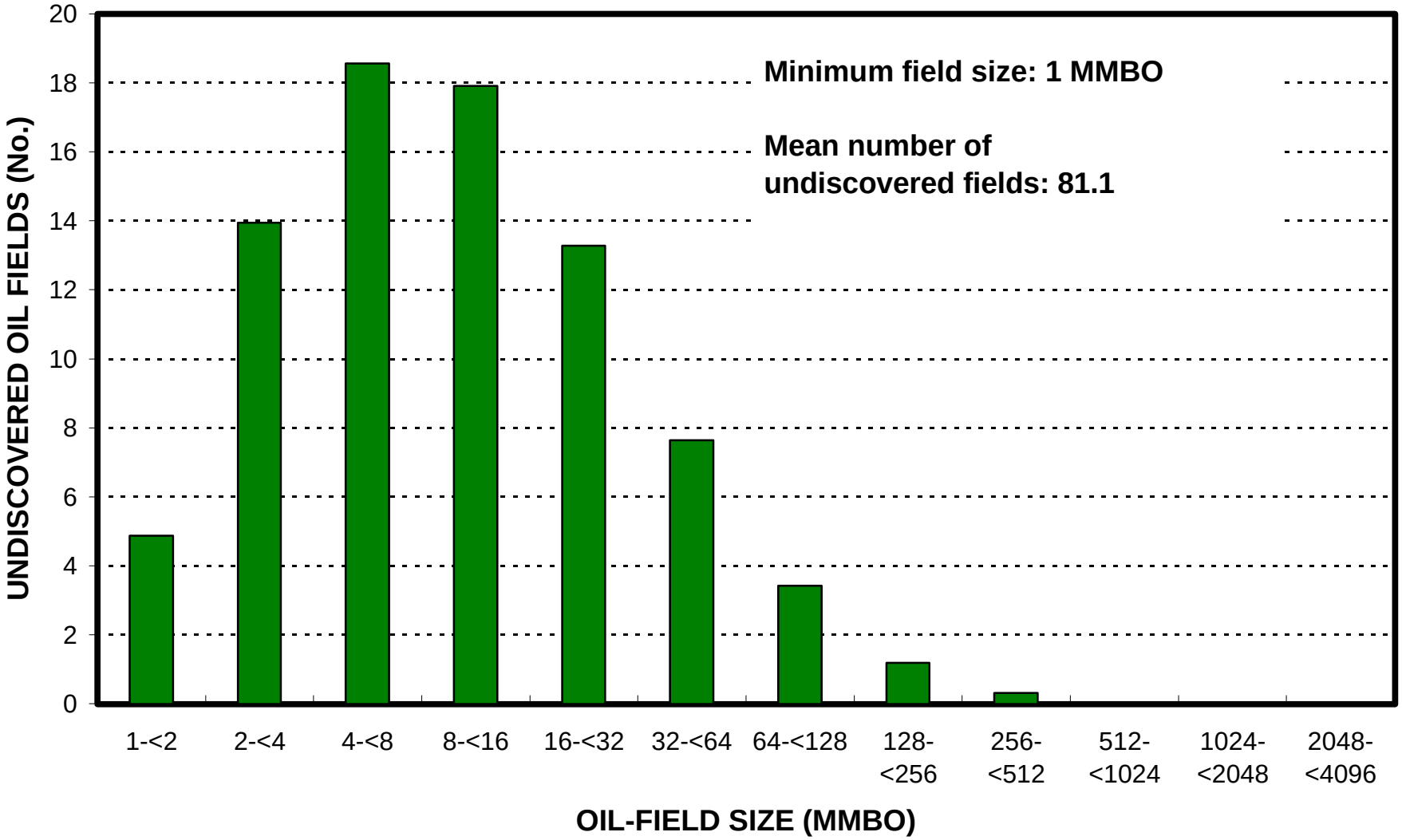
ALLOCATION OF UNDISCOVERED RESOURCES IN THE ASSESSMENT UNIT TO COUNTRIES OR OTHER LAND PARCELS (uncertainty of fixed but unknown values)

1. India represents 100 areal % of the total assessment unit

Oil in Oil Fields:	minimum	median	maximum
Richness factor (unitless multiplier):……			
Volume % in parcel (areal % x richness factor):…		100	
Portion of volume % that is offshore (0-100%)……		100	

Gas in Gas Fields:	minimum	median	maximum
Richness factor (unitless multiplier):……			
Volume % in parcel (areal % x richness factor):…		100	
Portion of volume % that is offshore (0-100%)……		100	

Eocene-Miocene Bombay Shelf, AU 80430101
Undiscovered Field-Size Distribution



Eocene-Miocene Bombay Shelf, AU 80430101
Undiscovered Field-Size Distribution