

Maturin Sub-Basin Assessment Unit 60980103



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 East Venezuela Basin Geologic Province 6098

USGS PROVINCE: East Venezuela Basin (6098)

GEOLOGIST: C.J. Schenk

TOTAL PETROLEUM SYSTEM: Querecual (609801)

ASSESSMENT UNIT: Maturin Sub-Basin (60980103)

DESCRIPTION: This assessment unit encompasses the area of the East Venezuela basin south of the Fold and Thrust Belt, west of the Orinoco Delta, and east of the Guarico Sub-Basin.

SOURCE ROCKS: The main source rocks are mudstones of the Upper Cretaceous Querecual Formation, a stratigraphic equivalent of the La Luna Formation.

MATURATION: Maturation of mudstones of the Querecual Formation to the north of the assessment unit occurred in the Oligocene to Miocene.

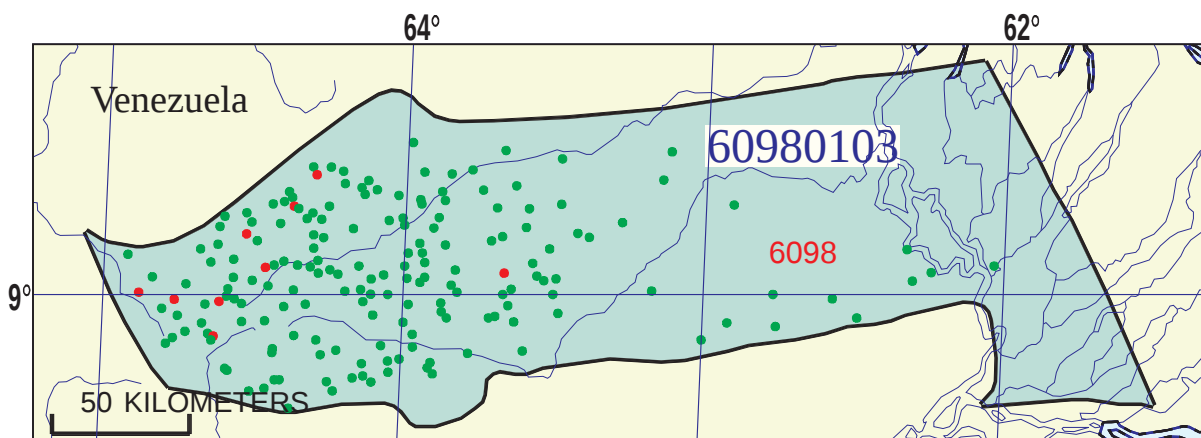
MIGRATION: Much of the oil from the Querecual mudstones migrated to the south from the generative areas prior to the development of significant structures in the foreland. Contemporaneous generation and structural development in the Miocene led to the trapping of hydrocarbons in the Maturin area.

RESERVOIR ROCKS: Reservoir rocks are mainly fluvial-deltaic sandstones in the Upper Cretaceous and Tertiary section, and are mainly in the Ofacina Group.

TRAPS AND SEALS: Traps range from stratigraphic traps in the Upper Cretaceous and Tertiary sandstones to structural traps formed as the fold and thrust structures propagated to the south, inverting earlier extensional structures. Seals are largely intraformational mudstones.

REFERENCES:

- Erlich, R.N., and Barrett, S.F., 1992, Petroleum geology of the eastern Venezuela foreland basin, *in* Macqueen, R.W., and Leckie, D.A., eds., *Foreland basins and fold belts: American Association of Petroleum Geologists Memoir 55*, p. 341-362.
- Lugo, J., and Audemard, F., 1997, Petroleum geology of Venezuela: American Association of Petroleum Geologists Short Course, Dallas, Texas, April 5-6, 1997, unpaginated.
- Parnaud, F., Gou, Y., Pascual, J-C., Truskowski, I., Gallango, O., Passalacqua, H., and Roure, F., 1995, Petroleum geology of the central part of the eastern Venezuelan basin, *in* Tankard, A.J., Suarez S., R., and Welsink, H.J., eds., *Petroleum basins of South America: American Association of Petroleum Geologists Memoir 62*, p. 741-756.



Maturin Sub-Basin Assessment Unit - 60980103

EXPLANATION

- Hydrography
- Shoreline
- 6098 — Geologic province code and boundary
- Country boundary
- Gas field centerpoint
- Oil field centerpoint
- 60980103 — Assessment unit code and boundary

Projection: Robinson. Central meridian: 0

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

Date:.....	<u>7/6/99</u>	
Assessment Geologist:.....	<u>C.J. Schenk</u>	
Region:.....	<u>Central and South America</u>	Number: <u>6</u>
Province:.....	<u>East Venezuela Basin</u>	Number: <u>6098</u>
Priority or Boutique:.....	<u>Priority</u>	
Total Petroleum System:.....	<u>Querecual</u>	Number: <u>609801</u>
Assessment Unit:.....	<u>Maturin Sub-Basin</u>	Number: <u>60980103</u>
* Notes from Assessor	<u>Lower 48 growth factor.</u>	

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: <u>133</u>	Gas: <u>5</u>
Established (>13 fields) <u>X</u>	Frontier (1-13 fields)	Hypothetical (no fields)

Median size (grown) of discovered oil fields (mmboe):			
1st 3rd <u>88</u>	2nd 3rd <u>21</u>	3rd 3rd <u>18</u>	
Median size (grown) of discovered gas fields (bcfg):			
1st 3rd <u>745</u>	2nd 3rd <u>23</u>	3rd 3rd	

Assessment-Unit Probabilities:

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

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.....	<u>1.0</u>
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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)	<u>40</u>	median no.	<u>180</u>	max no.	<u>350</u>
Gas fields:.....min. no. (>0)	<u>2</u>	median no.	<u>20</u>	max no.	<u>50</u>

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	<u>1</u>	median size	<u>5</u>	max. size	<u>250</u>
Gas in gas fields (bcfg):.....min. size	<u>6</u>	median size	<u>30</u>	max. size	<u>1500</u>

AVERAGE RATIOS FOR UNDISCOVERED FIELDS, TO ASSESS COPRODUCTS

(uncertainty of fixed but unknown values)

<u>Oil Fields:</u>	minimum	median	maximum
Gas/oil ratio (cfg/bo).....	500	1000	1500
NGL/gas ratio (bnl/mmcfg).....	30	60	90
<u>Gas fields:</u>	minimum	median	maximum
Liquids/gas ratio (bnl/mmcfg).....	22	44	66
Oil/gas ratio (bo/mmcfg).....			

SELECTED ANCILLARY DATA FOR UNDISCOVERED FIELDS

(variations in the properties of undiscovered fields)

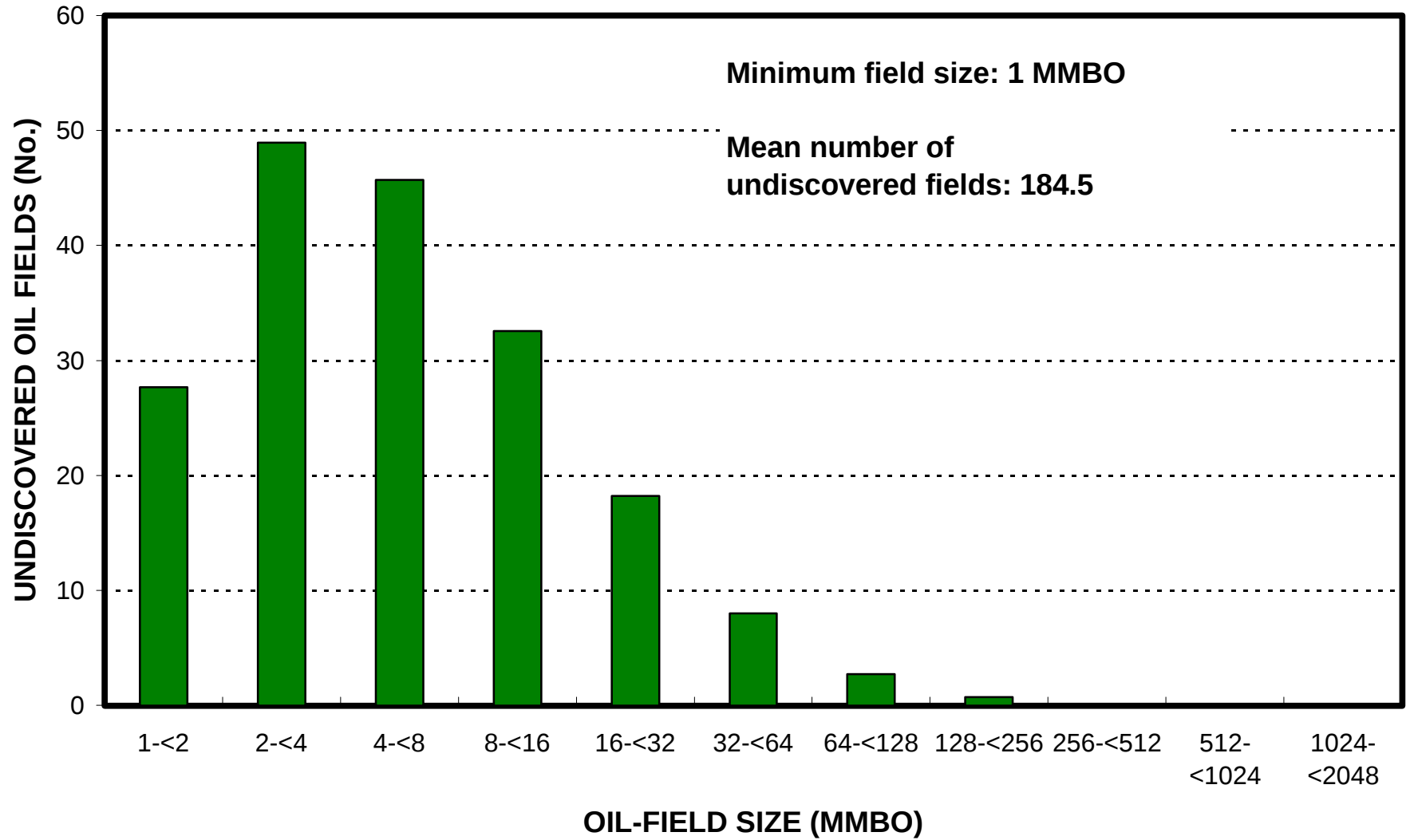
<u>Oil Fields:</u>	minimum	median	maximum
API gravity (degrees).....	10	30	50
Sulfur content of oil (%).....	0.5	1.2	3
Drilling Depth (m)	1000	3000	6000
Depth (m) of water (if applicable).....			
<u>Gas Fields:</u>	minimum	median	maximum
Inert gas content (%).....			
CO ₂ content (%).....			
Hydrogen-sulfide content (%).....			
Drilling Depth (m).....	1000	3000	6500
Depth (m) of water (if applicable).....			

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

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

<u>Oil in Oil Fields:</u>	minimum	median	maximum
Richness factor (unitless multiplier):.....	_____	_____	_____
Volume % in parcel (areal % x richness factor):...	_____	<u>100</u>	_____
Portion of volume % that is offshore (0-100%).....	_____	<u>0</u>	_____
<u>Gas in Gas Fields:</u>	minimum	median	maximum
Richness factor (unitless multiplier):.....	_____	_____	_____
Volume % in parcel (areal % x richness factor):...	_____	<u>100</u>	_____
Portion of volume % that is offshore (0-100%).....	_____	<u>0</u>	_____

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Undiscovered Field-Size Distribution



Maturin Sub-Basin, AU 60980103

Undiscovered Field-Size Distribution

