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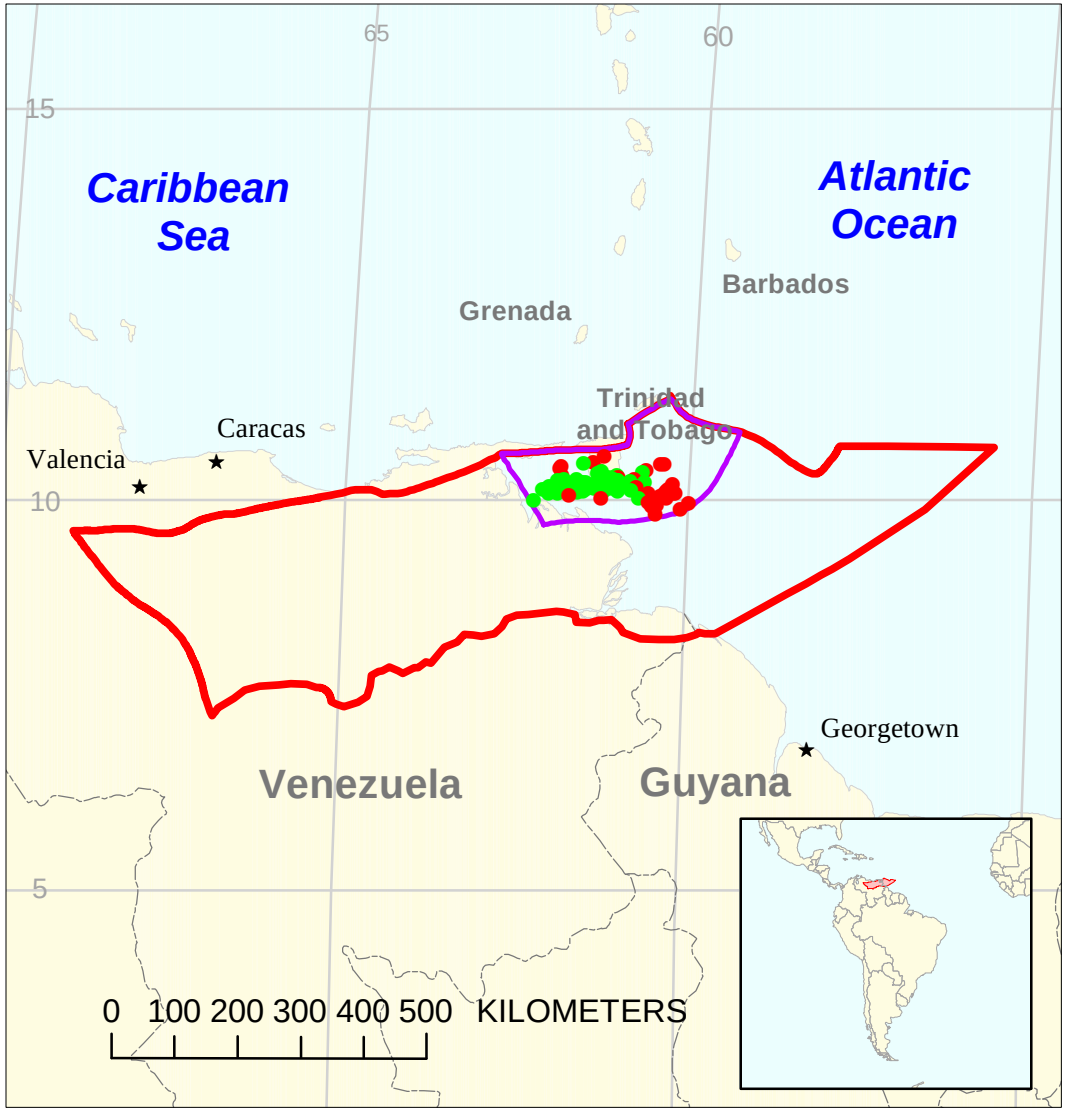
Trinidad Basins
Assessment Unit 60980201



Trinidad Basins Assessment Unit 60980201

East Venezuela Basin Geologic Province 6098

USGS PROVINCE: East Venezuela Basin (6098) **GEOLOGIST:** C.J. Schenk

TOTAL PETROLEUM SYSTEM: Upper Cretaceous/Tertiary (609802)

ASSESSMENT UNIT: Trinidad Basins (60980201)

DESCRIPTION: This assessment unit includes the onshore basins of Trinidad and the basins offshore Trinidad. The onshore basins are mainly oil bearing, and the offshore basins are gas bearing.

SOURCE ROCKS: The main source rocks are mudstones of the Miocene Lower Cruse Formation, but a source in the Upper Cretaceous may also be possible.

MATURATION: Maturation of Upper Cretaceous source rocks probably began in the Miocene, whereas maturation of the Miocene was most likely in the Pliocene and Pleistocene.

MIGRATION: Migration was mainly along the numerous growth faults associated with the progradation of the Orinoco delta, and migration was also along vertical along faults associated with the wrench fault zones. The timing of growth faulting was Miocene and Pliocene, and wrench faulting was late Pliocene and Pleistocene in the Columbus Basin.

RESERVOIR ROCKS: Reservoirs are mainly deltaic sandstones of the Miocene and Pliocene, but potential reservoir may exist in the Upper Cretaceous and Lower Tertiary section.

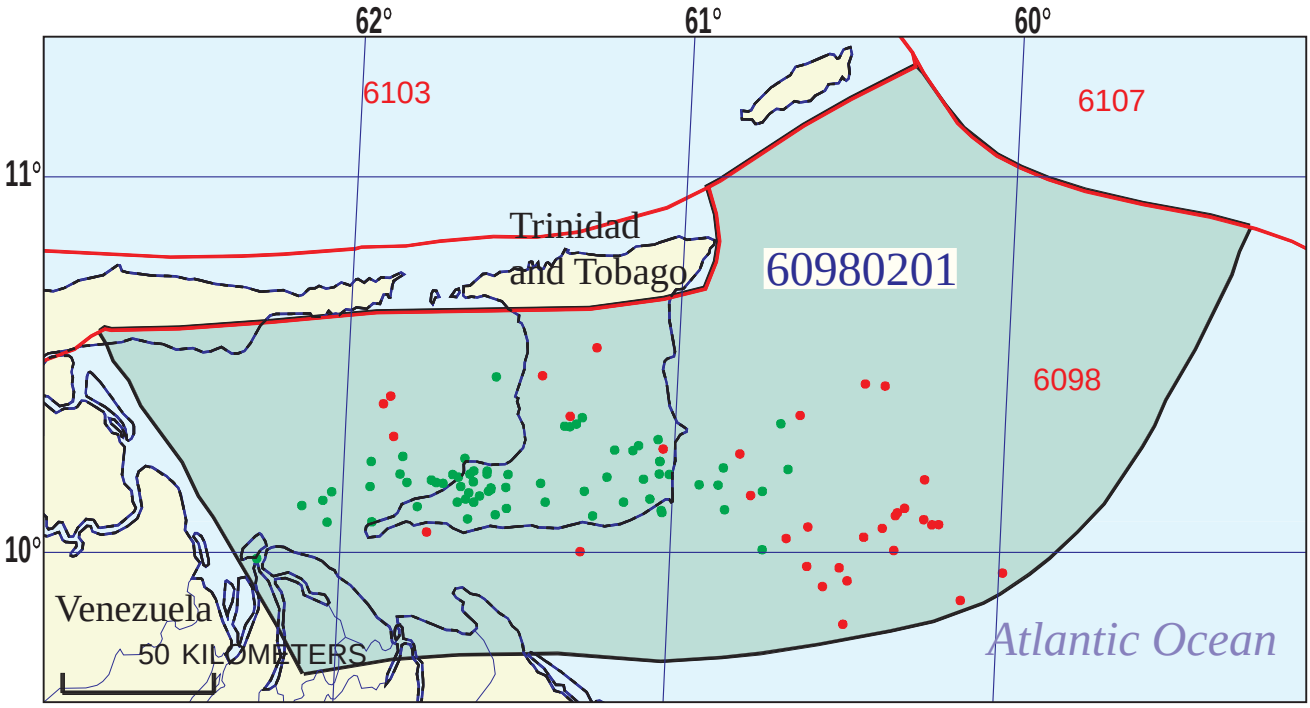
TRAPS AND SEALS: Traps are mainly structural, with normal fault traps formed by transtension associated with wrench faulting along the 150 km wide fault zone of the southern margin of the Caribbean plate. Traps formed in transpressional segments of the fault zone are also present. Seals are mainly intraformational mudstones of the Pliocene deltaic section.

REFERENCES:

Leonard, R., 1983, Geology and hydrocarbon accumulations, Columbus Basin, offshore Trinidad: American Association of Petroleum Geologists Bulletin, v. 67, p. 1081-1093.

Robertson, P., and Burke, K., 1989, Evolution of southern Caribbean plate boundary, vicinity of Trinidad and Tobago: American Association of Petroleum Geologists Bulletin, v. 73, p. 490-509.

Rodriques, K., 1987, Oil source bed recognition and crude oil correlation, Trinidad, West Indies: Organic Geochemistry, v. 13, p. 365-371.



Trinidad Basins
Assessment Unit - 60980201

EXPLANATION

- Hydrography
- Shoreline
- 6098 Geologic province code and boundary
- Country boundary
- Gas field centerpoint
- Oil field centerpoint
- 60980201 Assessment unit code and boundary

Projection: Robinson. Central meridian: 0

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

Date:……..	7/6/99		
Assessment Geologist:……..	C.J. Schenk		
Region:……..	Central and South America	Number:	6
Province:……..	East Venezuela Basin	Number:	6098
Priority or Boutique……	Priority		
Total Petroleum System:……	Upper Cretaceous/Tertiary	Number:	609802
Assessment Unit:……..	Trinidad Basins	Number:	60980201
* Notes from Assessor	Lower 48 growth factor.		

CHARACTERISTICS OF ASSESSMENT UNIT

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

What is the minimum field size?……. 4 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: 40 Gas: 24
Established (>13 fields) X Frontier (1-13 fields) _____ Hypothetical (no fields) _____

Median size (grown) of discovered oil fields (mmboe):
1st 3rd 52.1 2nd 3rd 22.2 3rd 3rd 32.4
Median size (grown) of discovered gas fields (bcfg):
1st 3rd 622 2nd 3rd 314 3rd 3rd 151

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)	2	median no.	20	max no.	45
Gas fields:……min. no. (>0)	14	median no.	100	max no.	220

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	4	median size	10	max. size	500
Gas in gas fields (bcfg):……min. size	24	median size	100	max. size	6000

Assessment Unit (name, no.)
Trinidad Basins, 60980201

AVERAGE RATIOS FOR UNDISCOVERED FIELDS, TO ASSESS COPRODUCTS

(uncertainty of fixed but unknown values)

Oil Fields:	minimum	median	maximum
Gas/oil ratio (cfg/bo)……	1000	2000	3000
NGL/gas ratio (bngl/mmcfg)……	30	60	90

Gas fields:	minimum	median	maximum
Liquids/gas ratio (bngl/mmcfg)……	22	44	66
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)……	15	30	50
Sulfur content of oil (%)……			
Drilling Depth (m) ……	1000	2500	5000
Depth (m) of water (if applicable)……	0	200	2000

Gas Fields:	minimum	median	maximum
Inert gas content (%)……			
CO_2 content (%)……			
Hydrogen-sulfide content (%)……			
Drilling Depth (m)……	1000	3000	6000
Depth (m) of water (if applicable)……	0	200	2000

Assessment Unit (name, no.)
Trinidad Basins, 60980201

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

1. Trinidad and Tobago represents 82 areal % of the total assessment unit

Oil in Oil Fields:	minimum	median	maximum
Richness factor (unitless multiplier):……			
Volume % in parcel (areal % x richness factor):…		90	
Portion of volume % that is offshore (0-100%)……		90	

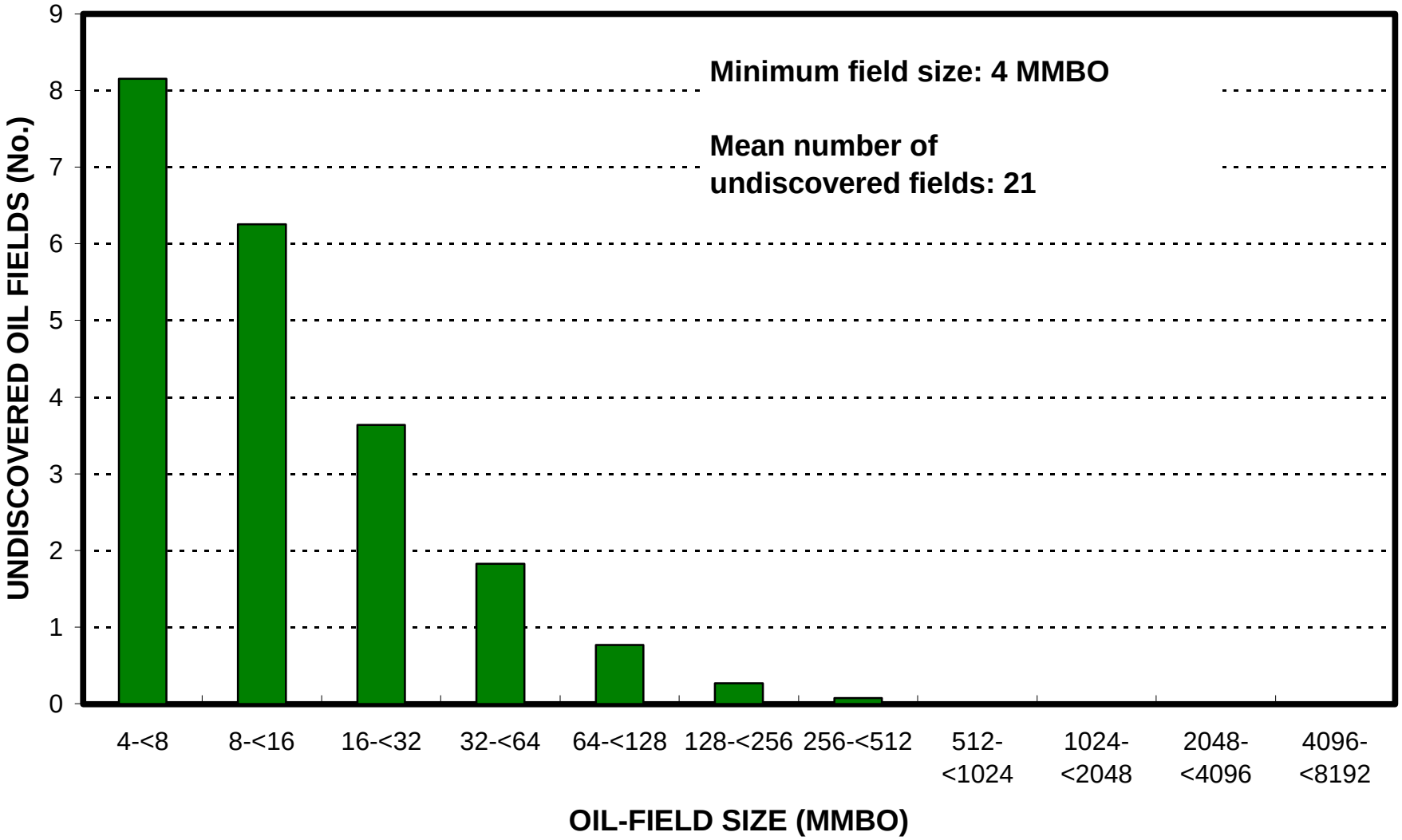
Gas in Gas Fields:	minimum	median	maximum
Richness factor (unitless multiplier):……			
Volume % in parcel (areal % x richness factor):…		90	
Portion of volume % that is offshore (0-100%)……		95	

2. Venezuela represents 18 areal % of the total assessment unit

Oil in Oil Fields:	minimum	median	maximum
Richness factor (unitless multiplier):……			
Volume % in parcel (areal % x richness factor):…		10	
Portion of volume % that is offshore (0-100%)……		95	

Gas in Gas Fields:	minimum	median	maximum
Richness factor (unitless multiplier):……			
Volume % in parcel (areal % x richness factor):…		10	
Portion of volume % that is offshore (0-100%)……		95	

Trinidad Basins, AU 60980201
Undiscovered Field-Size Distribution



Trinidad Basins, AU 60980201
Undiscovered Field-Size Distribution