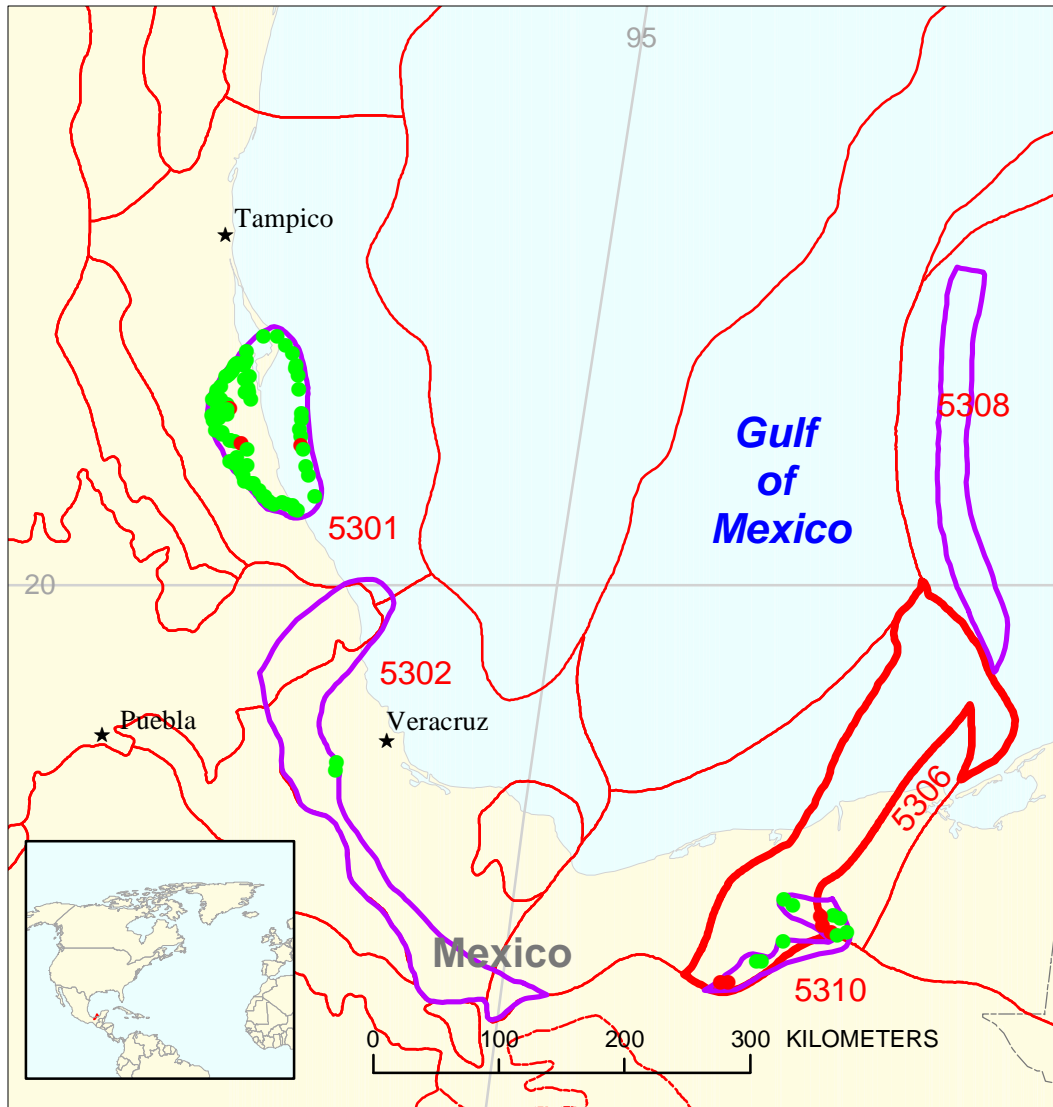# El Abra-Like Reef and Backreef Limestone Assessment Unit 53050101

95

Tampico

5308

Gulf
of
Mexico

5301

20

5302

Puebla

Veracruz

5306

Mexico

5310

0   100   200   300 KILOMETERS

⬜ El Abra-Like Reef and Backreef Limestone Assessment Unit 53050101

⬜ Villahermosa Uplift Geologic Province 5305

⬜ Other geologic province boundary

USGS PROVINCES: Veracruz Basin (5302), Tampico-Misantla Basin (5301), Yucatan Platform (5308), Trans-Mexican Neovolcanic Axis (5316), Villahermosa Uplift (5305), Saline-Comalcalco Basin (5304), Sierra Madre de Chiapas-Petan Foldbelt (5310), and Macuspana Basin (5306)

GEOLOGIST: L.B. Magoon III

TOTAL PETROLEUM SYSTEM: Pimienta-Tamabra (530501)

ASSESSMENT UNIT: El Abra-Like Reef and Backreef Limestone (53050101)

DESCRIPTION: This assessment unit includes traps in the El Abralike limestone reservoir facies in the Pimienta-Tamabra total petroleum system.

SOURCE ROCK: Pimientalike shale is an organic-rich source rock that includes all the Upper Jurassic (Oxfordian, Kimmeridgian, and Tithonian) sedimentary rocks and covers the entire southern Gulf of Mexico. It is as thick as 1.5 km, has a richness of as much as 5 wt. % TOC, and whose source rock quality is as much as HI of 750 g HC/gm TOC. All oil samples from several provinces (5301, 5304, and 5305) are similar to each other and compare favorably with extracts from the Pimientalike shale.

MATURATION: The Gulf of Mexico basin whose geometry was established in Oxfordian time is still filling with sediment. This simple burial history allows that the burial depth below the sediment-water interface to the oil window be 5 km. Depending upon where the burial history chart in the southern Gulf of Mexico is located, the onset of oil generation ranges from Eocene to Miocene time.

MIGRATION: Migration of oil and dissolved gas from the Upper Jurassic source rock begins in Eocene to Miocene time after most of the reservoir and seal rocks are deposited and the structural geometry of the traps established. Although the source rock in the center of the southern Gulf of Mexico is in the gas window, there is a lack of large natural gas fields indicating that the source rock is depleted within the oil window.

RESERVOIR ROCKS (CRETACEOUS AND TERTIARY): El Abralike limestone (Platform Margin and Platform Interior Environment): Reservoirs developed in El Abralike limestone are comprised of rudistid, bioclastic, and oolitic limestone facies that formed in platform margin settings and pelloidal bioclastic facies and stromatolitic-birds-eye facies that were deposited in platform interior settings. The platform margin contains the best reservoirs where porosity is mainly interparticle, skeletal moldic, intercrystal, vuggy, and cavernous karst porosity. In producing fields, porosity ranges from 14 percent to 18percent, and permeability is as much as 2000 millidarcies. Reservoir porosity in the platform interior facies may be primarily moldic, and intercrystal. In producing fields, porosity is as much as 14 percent, and permeability ranges from 8 millidarcies to 50 millidarcies. Most reservoir rocks are mid-Cretaceous (71 percent) in age, followed by Miocene (16 percent) age.

TRAPS AND SEALS: Stratigraphic and structural; seals of carbonate mudstone.

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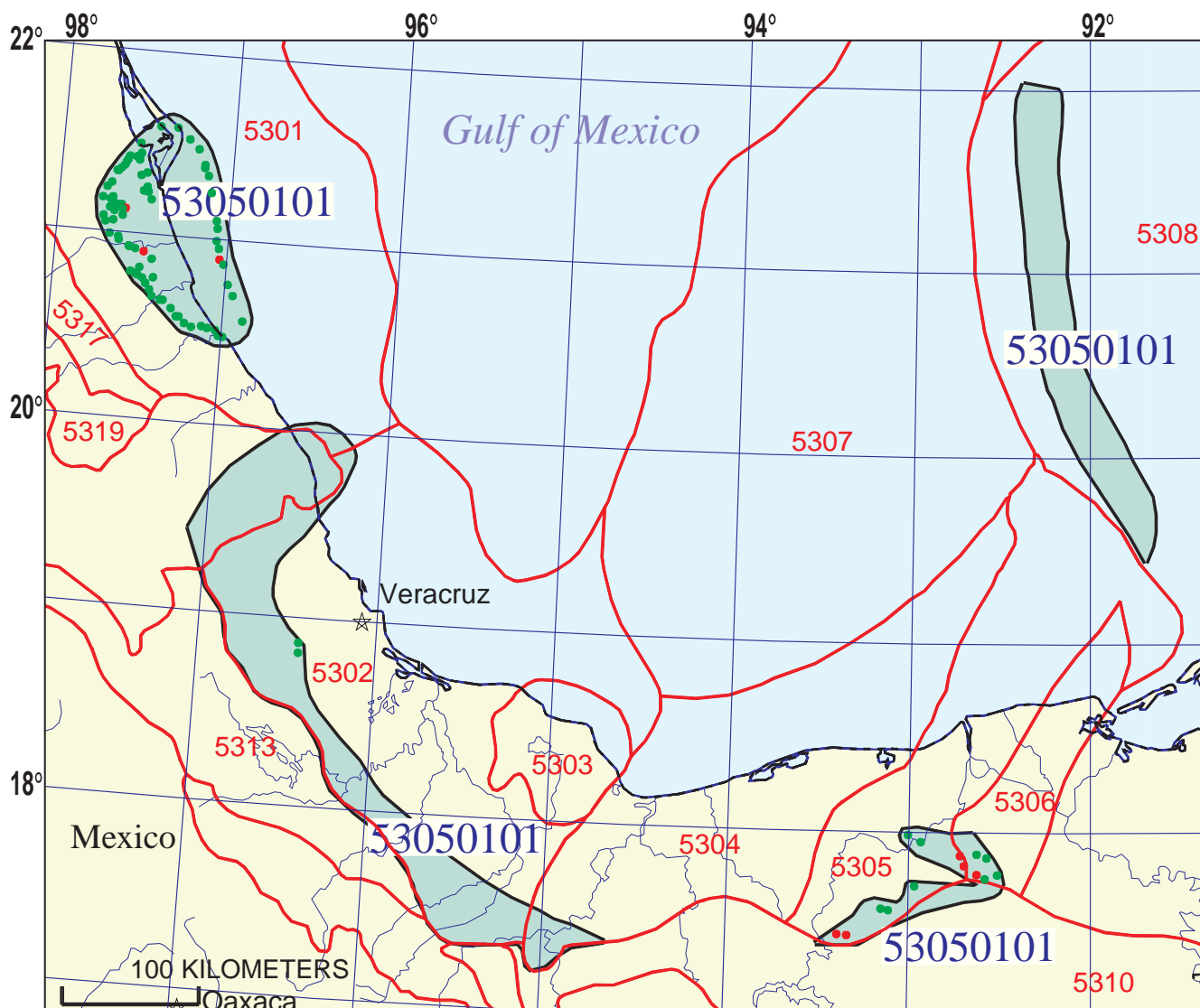
El Abra-Like Reef and Backreef Limestone
Assessment Unit - 53050101

EXPLANATION

——— Hydrography

——— Shoreline

5305 ——— Geologic province code and boundary

- - - Country boundary

• Gas field centerpoint

• Oil field centerpoint

53050101 ——— Assessment unit code and boundary

Projection: Lambert. Standard parallels: 49 and 77. Central meridian: -92

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

Date:…………………….. 11/30/99

Assessment Geologist:…….. L.B. Magoon

Region:……………………. North America   Number: 5

Province:……………………. Villahermosa Uplift   Number: 5305

Priority or Boutique………… Priority

Total Petroleum System:…… Pimienta-Tamabra   Number: 530501

Assessment Unit:…………… El Abra-Like Reef and Backreef Limestone   Number: 53050101

* Notes from Assessor   MMS 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: 52   Gas: 4

    Established (>13 fields)   X   Frontier (1-13 fields)   Hypothetical (no fields)

Median size (grown) of discovered oil fields (mmboe):

    1st 3rd   15   2nd 3rd   12   3rd 3rd   16

Median size (grown) of discovered gas fields (bcfg):

    1st 3rd   36   2nd 3rd   248   3rd 3rd

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)

	min. no. (>0)	median no.	max no.
Oil fields:……………………………	5	20	50
Gas fields:…………………………..	1	2	4

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

	min. size	median size	max. size
Oil in oil fields (mmbo)………………..……	1	8	200
Gas in gas fields (bcfg):……………………	6	48	500

AVERAGE RATIOS FOR UNDISCOVERED FIELDS, TO ASSESS COPRODUCTS
(uncertainty of fixed but unknown values)

Oil Fields:	minimum	median	maximum
Gas/oil ratio (cfg/bo)……………………...………	650	1300	1950
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	25	55
Sulfur content of oil (%)…………………...……	0.5	2	8
Drilling Depth (m) ……………...………….……..	500	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)…………………….……………	500	2500	5000
Depth (m) of water (if applicable)……………….	0	200	2000

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

1. Mexico _____ 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%)……		44	

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%)……		44	

2. Province 5302 _____ represents ___28___ areal % of the total assessment unit

Oil in Oil Fields:	minimum	median	maximum
Richness factor (unitless multiplier):……….…..…			
Volume % in parcel (areal % x richness factor):…		33	
Portion of volume % that is offshore (0-100%)……		0	

Gas in Gas Fields:	minimum	median	maximum
Richness factor (unitless multiplier):……….…..…			
Volume % in parcel (areal % x richness factor):…		33	
Portion of volume % that is offshore (0-100%)……		0	

3. Province 5301 _____ represents ___26___ areal % of the total assessment unit

Oil in Oil Fields:	minimum	median	maximum
Richness factor (unitless multiplier):……….…..…			
Volume % in parcel (areal % x richness factor):…		15	
Portion of volume % that is offshore (0-100%)……		75	

Gas in Gas Fields:	minimum	median	maximum
Richness factor (unitless multiplier):……….…..…			
Volume % in parcel (areal % x richness factor):…		15	
Portion of volume % that is offshore (0-100%)……		75	

4. Province 5308 _____ represents ___22___ areal % of the total assessment unit

Oil in Oil Fields:	minimum	median	maximum
Richness factor (unitless multiplier):……….…..…			
Volume % in parcel (areal % x richness factor):…		33	
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):…		33	
Portion of volume % that is offshore (0-100%)……		100	

5. Province 5316 _____ represents __12__ areal % of the total assessment unit

Oil in Oil Fields:	minimum	median	maximum
Richness factor (unitless multiplier):…………..…			
Volume % in parcel (areal % x richness factor):…		2	
Portion of volume % that is offshore (0-100%)……		5	

Gas in Gas Fields:	minimum	median	maximum
Richness factor (unitless multiplier):…………..…			
Volume % in parcel (areal % x richness factor):…		2	
Portion of volume % that is offshore (0-100%)……		5	

6. Province 5305 _____ represents __5__ 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%)……		0	

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%)……		0	

7. Province 5304 _____ represents __3__ areal % of the total assessment unit

Oil in Oil Fields:	minimum	median	maximum
Richness factor (unitless multiplier):…………..…			
Volume % in parcel (areal % x richness factor):…		5	
Portion of volume % that is offshore (0-100%)……		0	

Gas in Gas Fields:	minimum	median	maximum
Richness factor (unitless multiplier):…………..…			
Volume % in parcel (areal % x richness factor):…		5	
Portion of volume % that is offshore (0-100%)……		0	

8. Province 5310 _____ represents __2__ areal % of the total assessment unit

Oil in Oil Fields:	minimum	median	maximum
Richness factor (unitless multiplier):…………..…			
Volume % in parcel (areal % x richness factor):…		1	
Portion of volume % that is offshore (0-100%)……		0	

Gas in Gas Fields:	minimum	median	maximum
Richness factor (unitless multiplier):…………..…			
Volume % in parcel (areal % x richness factor):…		1	
Portion of volume % that is offshore (0-100%)……		0	

9. Province 5306 _____ represents __2__ areal % of the total assessment unit

Oil in Oil Fields:	minimum	median	maximum
Richness factor (unitless multiplier):…………..…			
Volume % in parcel (areal % x richness factor):…		1	
Portion of volume % that is offshore (0-100%)……		0	

Gas in Gas Fields:	minimum	median	maximum
Richness factor (unitless multiplier):…………..…			
Volume % in parcel (areal % x richness factor):…		1	

Portion of volume % that is offshore (0-100%)……   0