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Basin-Center Gas
Assessment Unit 60410102

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Putumayo-Oriente-Maranon Basin Geologic Province 6041

Geologic Summary

Detailed map of this assessment unit

Assessment Input Data

Assessment Results

This assessment unit was not assessed quantitatively.

USGS PROVINCE: Putumayo-Oriente-Maranon Basin (6041) **GEOLOGIST:** D.K. Higley

TOTAL PETROLEUM SYSTEM: Mesozoic-Cenozoic (604101)

ASSESSMENT UNIT: Basin-Center Gas (60410102)

DESCRIPTION: The Basin-Center Gas assessment unit (60410102) is hypothetical on the basis of similarities between this basin to others that contain basin-center gas fields. The common characteristics include structural, depositional and thermal history, and potential reservoir and source rocks.

SOURCE ROCKS: Primary source rocks in this province would be marine shales of the Cretaceous Napo, Chonta, and Agua Caliente Formations.

MATURATION: An area in the southwestern Oriente and northwestern Maranon Basins may be thermally mature for gas generation (Mathalone and Montoya, 1995). The primary times of source rock maturation across the province would be Miocene and Pliocene; this includes probably gas generation in the deeper part of the Oriente and Maranon Basins.

MIGRATION: There commonly is only limited vertical and lateral migration of hydrocarbons in these low-permeability reservoirs. Potential reservoir rocks are bounded by low-permeability marine shales that would be within the gas generation window. Leakage may occur along fault and fracture systems and permeable reservoir facies that are laterally connected.

RESERVOIR ROCKS: The most favorable reservoir facies is low-permeability nearshore marine sandstones of the Napo, Chonta, and Agua Caliente Formations. Some potential exists within shoreface, deltaic, and fluvial sandstones where faulting, erosional truncation, or diagenetic cementation isolates these facies and decreases lateral and vertical leakage of gas.

TRAPS AND SEALS: Trap types for basin-center gas reservoirs are commonly a combination of stratigraphic and structural controls. These gas fields generally occur in basin lows, as opposed to structural highs. There is frequently no gas-water contact and reservoir intervals are low permeability and normal to underpressured. The major traps and seals are interbedded and overlying low-permeability mudstones or salts, pinch-out of reservoir intervals against "tight" sandstones or shales, facies change such as offshore marine sandstone bars that are isolated by marine shales, and offset by fault movement of reservoir intervals with truncation against permeability barriers. The probable main reservoir seals would be interbedded and overlying marine shales.

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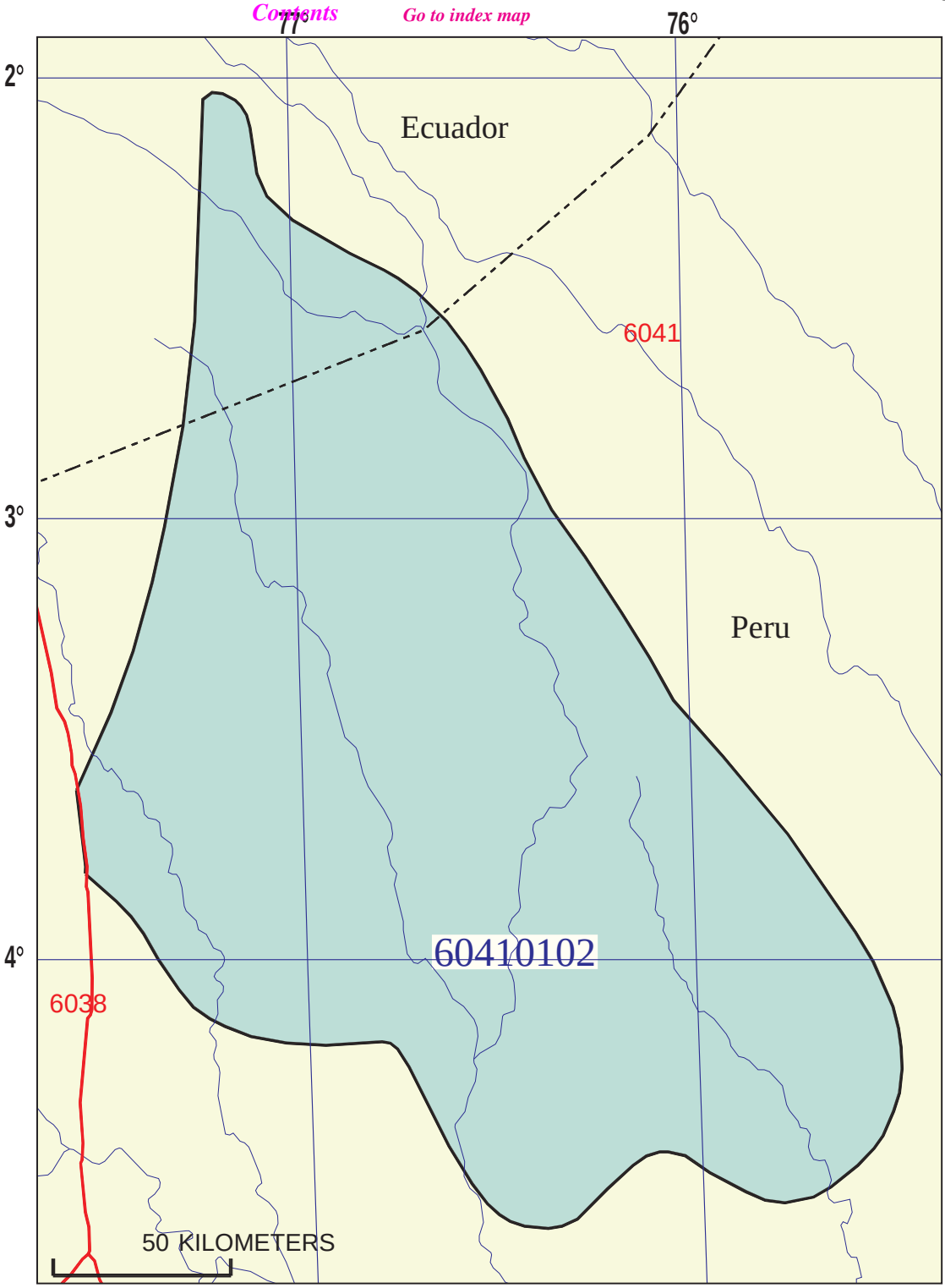

Basin-Center Gas
Assessment Unit - 60410102

EXPLANATION

- Hydrography
- Shoreline
- 6041 — Geologic province code and boundary
- Country boundary
- Gas field centerpoint
- Oil field centerpoint
- 60410102 — Assessment unit code and boundary

Projection: Robinson. Central meridian: 0

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

Date:…….. 2/4/99
Assessment Geologist:…….. D.K. Higley
Region:…….. Central and South America Number: 6
Province:…….. Putumayo-Oriente-Maranon Basin Number: 6041
Priority or Boutique…….. Priority
Total Petroleum System:…… Mesozoic-Cenozoic Number: 604101
Assessment Unit:…….. Basin-Center Gas Number: 60410102
* Notes from Assessor

CHARACTERISTICS OF ASSESSMENT UNIT

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

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

Median size (grown) of discovered oil fields (mmboe):
1st 3rd _____ 2nd 3rd _____ 3rd 3rd _____
Median size (grown) of discovered gas fields (bcfg):
1st 3rd _____ 2nd 3rd _____ 3rd 3rd _____

Assessment-Unit Probabilities:

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

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

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

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) _____ median no. _____ max no. _____
Gas fields:……min. no. (>0) _____ median no. _____ max no. _____

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 _____ median size _____ max. size _____
Gas in gas fields (bcfg):…….. min. size _____ median size _____ max. size _____

Assessment Unit (name, no.)

_____

AVERAGE RATIOS FOR UNDISCOVERED FIELDS, TO ASSESS COPRODUCTS

(uncertainty of fixed but unknown values)

Oil Fields:	minimum	median	maximum
Gas/oil ratio (cfg/bo)……			
NGL/gas ratio (bngl/mmcfg)……			

Gas fields:	minimum	median	maximum
Liquids/gas ratio (bngl/mmcfg)……			
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)……			
Sulfur content of oil (%)……			
Drilling Depth (m) ……			
Depth (m) of water (if applicable)……			

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

Assessment Unit (name, no.)

_____

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

1. _____ represents _____ areal % of the total assessment unit

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

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