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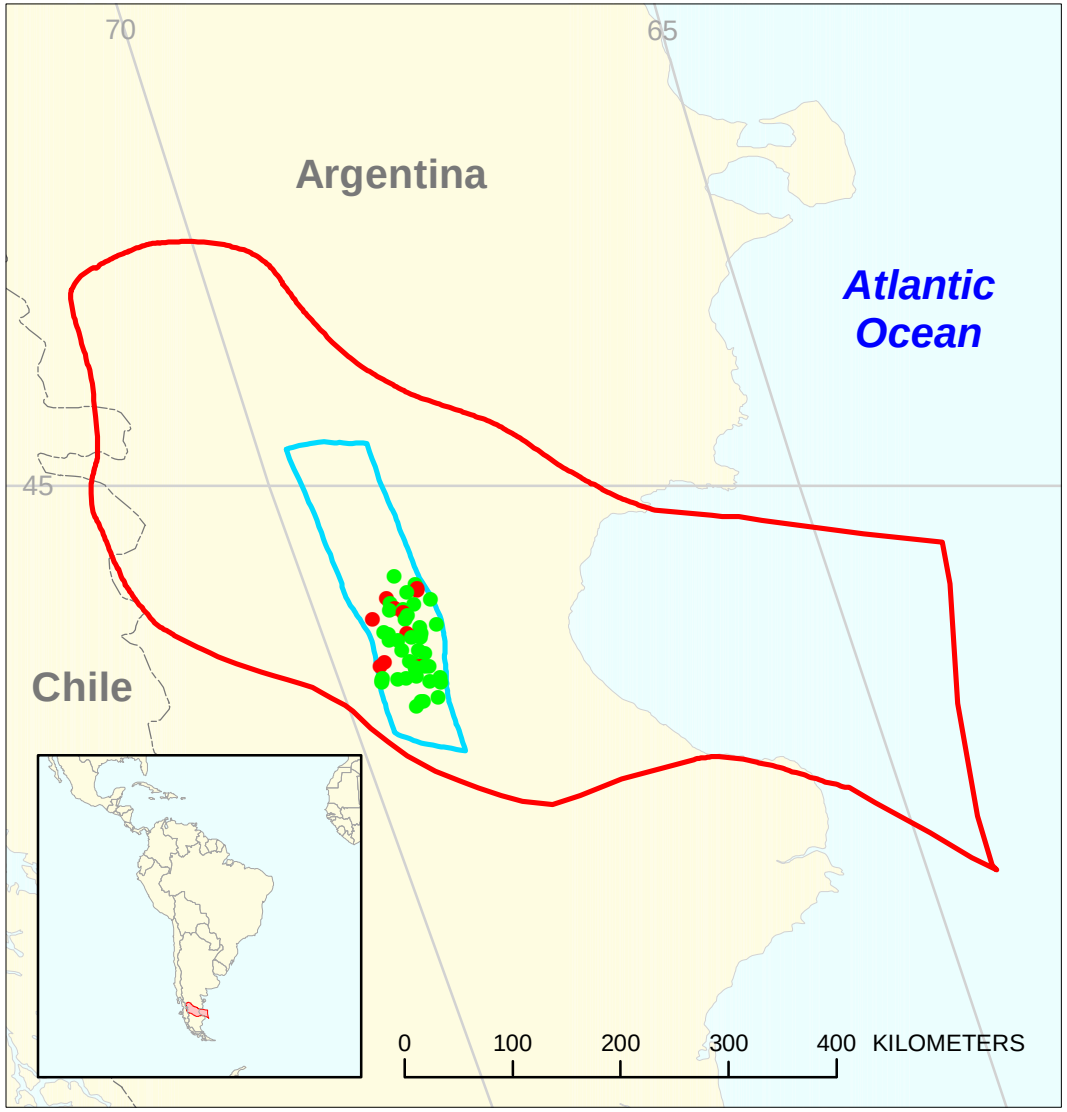
San Bernardo Fold Belt Structures
Assessment Unit 60580102



San Bernardo Fold Belt Structures Assessment Unit 60580102
San Jorge Basin Geologic Province 6058

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: San Jorge Basin (6058) **GEOLOGIST:** C.J. Schenk

TOTAL PETROLEUM SYSTEM: D-129 (605801)

ASSESSMENT UNIT: San Bernardo Fold Belt Structures (60580102)

DESCRIPTION: This assessment unit is defined by structural traps along the extent of the north-south trending San Bernardo Fold Belt, a zone of gentle folds related to Early Tertiary compressional tectonics that separated the first assessment unit into eastern and western segments.

SOURCE ROCKS: Source rocks include lacustrine mudstones of the Early Cretaceous D-129 Formation.

MATURATION: In this part of the basin D-129 mudstones are interpreted to have matured in the Middle to Late Cretaceous.

MIGRATION: Hydrocarbons in this assessment unit were remobilized during the Andean tectonic event in the Early Tertiary.

RESERVOIR ROCKS: Major reservoirs include Late Cretaceous Chubut Group sandstones and Paleocene Salamanca Formation sandstones. Reservoir rocks are progressively truncated to the north along the San Bernardo Fold Belt.

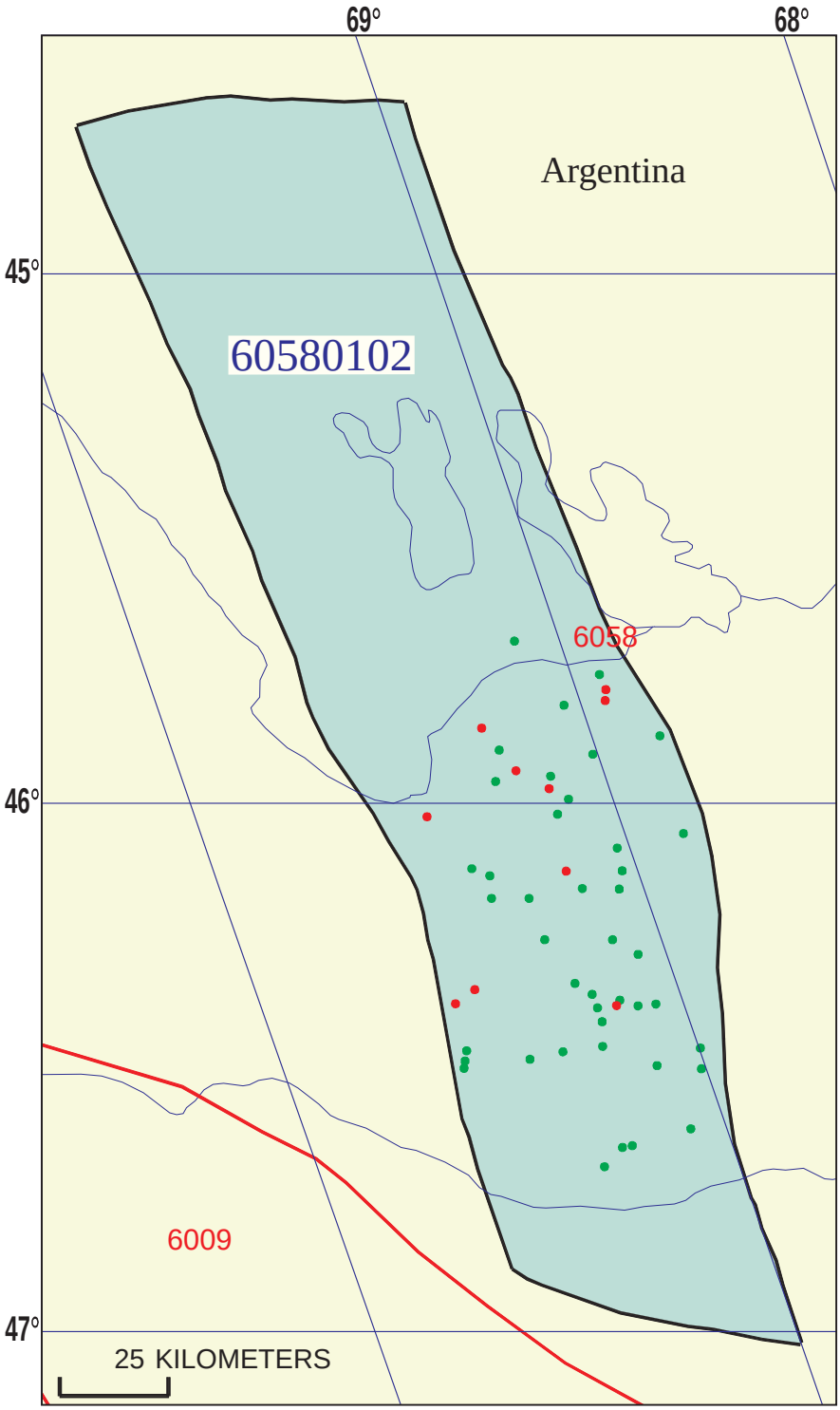
TRAPS AND SEALS: Traps include anticlines, faulted anticlines, and gentle folds formed during the Andean tectonic event in the Early Tertiary. Seals are generally intraformational mudstones.

REFERENCES

Figari, E., Conforto, G., Cid de La Paz, M., and Cevallos, M., 1998, Extensional tectonics and related structures in the south flank of the San Jorge Basin, Argentina, *in* Mello, M.R., and Yilmaz, P.O., eds., Petroleum geology in a changing world: American Association of Petroleum Geologists International Conference, Extended Abstracts Volume, Rio de Janiero, p. 864-865.

Fitzgerald, M.G., Mitchum, R.M., Uliana, M.A., and Biddle, K.T., 1990, Evolution of the San Jorge Basin, Argentina: American Association of Petroleum Geologists Bulletin, v. 74, no. 6, p. 879-920.

Petroconsultants, 1994, San Jorge Basin, Argentina–Basin Monitor: Geneva, Switzerland, Petroconsultants International, chapter paginated.



San Bernardo Fold Belt Structures Assessment Unit - 60580102

EXPLANATION

- Hydrography
- Shoreline
- 6058 — Geologic province code and boundary
- Country boundary
- Gas field centerpoint
- Oil field centerpoint
- 60580102 — Assessment unit code and boundary

Projection: Robinson. Central meridian: 0

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

Date:……..	2/3/99		
Assessment Geologist:……..	C.J. Schenk		
Region:……..	Central and South America	Number:	6
Province:……..	San Jorge Basin	Number:	6058
Priority or Boutique…….	Priority		
Total Petroleum System:……	D-129	Number:	605801
Assessment Unit:……..	San Bernardo Fold Belt Structures	Number:	60580102
* 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?……. 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: 24 Gas: 8

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

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

1st 3rd	2nd 3rd	3rd 3rd
22	8.5	3.3

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

1st 3rd	2nd 3rd	3rd 3rd
21	19	

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)	3	median no.	30	max no.	60
Gas fields:…….min. no. (>0)	2	median no.	20	max no.	40

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	3	max. size	80
Gas in gas fields (bcfg):……..	min. size	6	median size	18	max. size	250

Assessment Unit (name, no.)
San Bernardo Fold Belt Structures, 60580102

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	1500	2000
NGL/gas ratio (bngl/mmcfg)……	10	20	30

Gas fields:	minimum	median	maximum
Liquids/gas ratio (bngl/mmcfg)……	10	20	30
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	35
Sulfur content of oil (%)……	0.08	0.15	0.22
Drilling Depth (m) ……	500	1000	2500
Depth (m) of water (if applicable)……			

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

Assessment Unit (name, no.)
San Bernardo Fold Belt Structures, 60580102

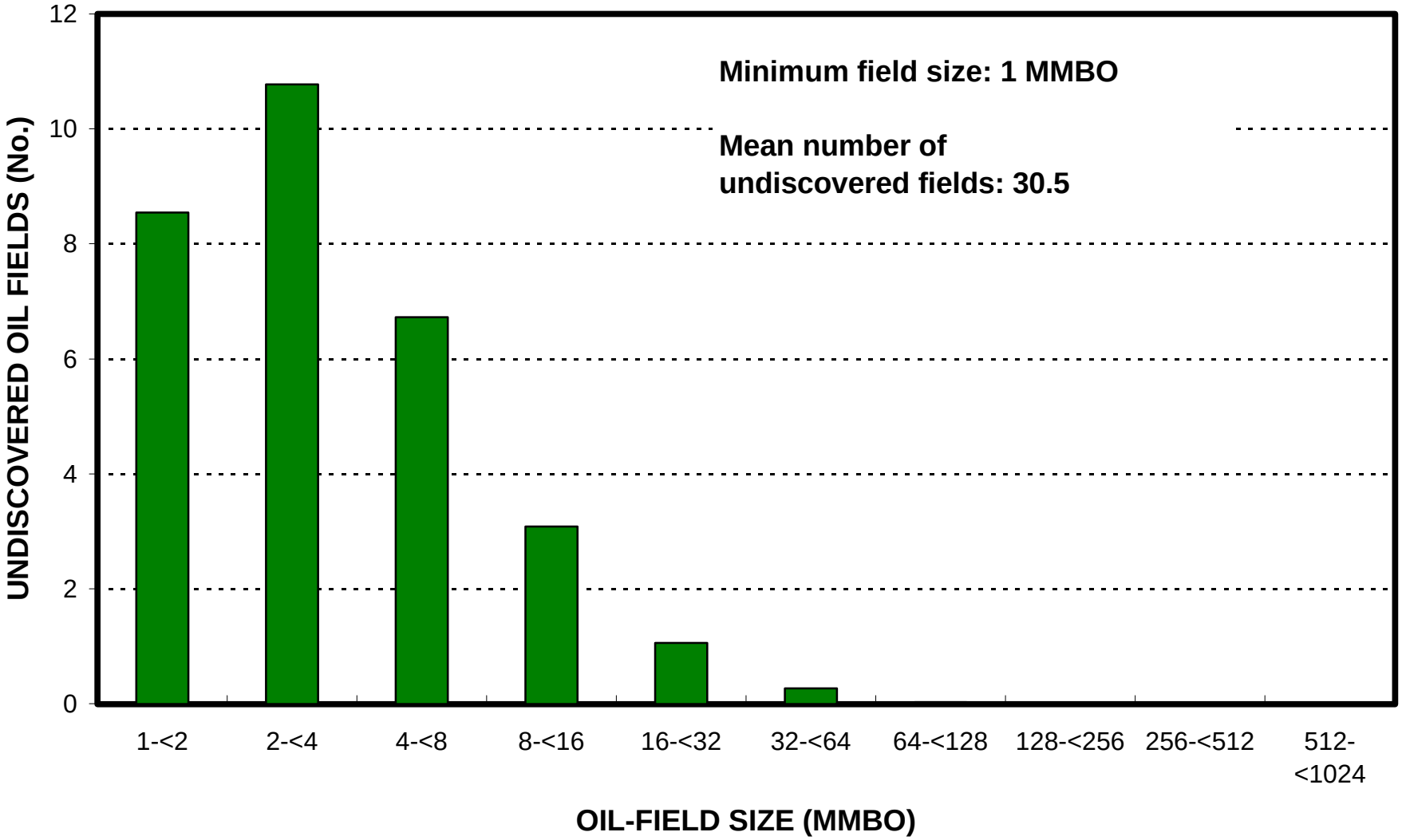
ALLOCATION OF UNDISCOVERED RESOURCES IN THE ASSESSMENT UNIT TO COUNTRIES OR OTHER LAND PARCELS (uncertainty of fixed but unknown values)

1. Argentina 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%)……		0	

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%)……		0	

San Benardo Fold Belt Structures, AU 60580102
Undiscovered Field-Size Distribution



San Benardo Fold Belt Structures, AU 60580102
Undiscovered Field-Size Distribution