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Southwest Foldbelt
Assessment Unit 31540103

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Tarim Basin Geologic Province 3154

Geologic Summary

Detailed map of this assessment unit

Assessment Input Data

Assessment Results

- Assessment Unit Summary
- Detailed Assessment Results
- Undiscovered Field-Size Distributions

USGS PROVINCE: Tarim Basin (3154) **GEOLOGIST:** R.T. Ryder

TOTAL PETROLEUM SYSTEM: Ordovician/Jurassic-Phanerozoic (315401)

ASSESSMENT UNIT: Southwest Foldbelt (31540103)

DESCRIPTION: The assessment unit is characterized by structurally controlled oil and gas fields in Cretaceous and Cenozoic sandstone reservoirs in the Southwest fold-and-thrust belt. Another characteristic of the assessment unit is a deeply buried pod of mature marine-shelf to nonmarine Carboniferous and nonmarine Jurassic source rocks.

SOURCE ROCKS: Source rocks are marine limestone and coal beds(?) of the Middle and Upper Carboniferous sequence and lacustrine shale and coal beds of the Lower and Middle Jurassic sequence. The thickness of the Jurassic source rock sequence ranges from 500 to 1,000 m. Oil in the assessment unit appears to be derived from marine source rocks of the Carboniferous sequence whereas gas is derived from coal beds of the Carboniferous and Jurassic sequences.

MATURATION: The Carboniferous source beds have been mature with respect to oil and gas generation since about Early Jurassic time. However, most hydrocarbons were generated during the late Neogene (Pliocene) as a result of deep burial of Carboniferous and Jurassic source rocks beneath thick molasse deposits derived from the Kunlun Mountains. A geothermal gradient of about 20 to 22°C/km probably accompanied oil and gas generation.

MIGRATION: Oil and gas may have migrated laterally as much as 50 km from the pod of mature Carboniferous and Jurassic source rocks before entrapment in Cretaceous and Cenozoic sandstone reservoirs. Commonly, oil and gas derived from Carboniferous and Jurassic source rocks migrated vertically along faults for several thousands of meters into Cenozoic (Oligocene-Miocene) sandstone reservoirs.

RESERVOIR ROCK: Primary reservoir rocks consist of fluvial-lacustrine fine-grained sandstone interbedded with siltstone in the Miocene Wuqia Formation. Porosity of the sandstone reservoirs ranges from 13 to 16 percent and the permeability ranges from 11 to 91 mD. Potential reservoirs of Late Cretaceous age consist of fluvial and shallow marine deposits.

TRAPS AND SEALS: The major traps are anticlines and fault blocks of compressional origin. Stratigraphic traps (lithologic, diagenetic, onlap, and unconformity varieties) may account for additional entrapment. Shale and local evaporites in Upper Cretaceous through Miocene strata are the seal rocks.

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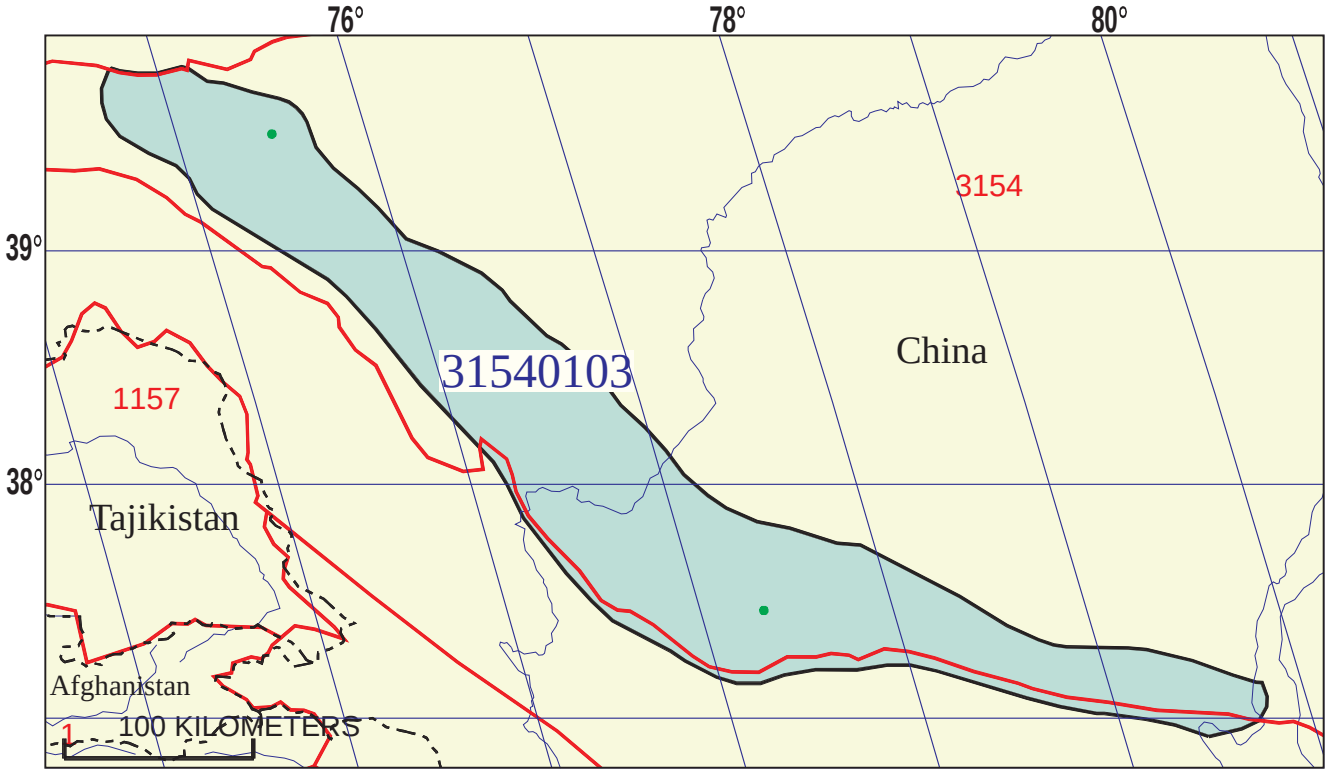


Southwest Foldbelt
Assessment Unit - 31540103

EXPLANATION

- Hydrography
- Shoreline
- 3154 — Geologic province code and boundary
- Country boundary
- Gas field centerpoint
- Oil field centerpoint
- 31540103 — Assessment unit code and boundary

Projection: Robinson. Central meridian: 0

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

Date:……..	11/10/99		
Assessment Geologist:……..	R.T. Ryder		
Region:……..	Asia Pacific	Number:	3
Province:……..	Tarim Basin	Number:	3154
Priority or Boutique……	Boutique		
Total Petroleum System:……	Ordovician/Jurassic-Phanerozoic	Number:	315401
Assessment Unit:……..	Southwest Foldbelt	Number:	31540103
* 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?……. 10 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: 1 Gas: 0

Established (>13 fields) _____ Frontier (1-13 fields) X 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……	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)	1	median no.	8	max no.	20
Gas fields:……min. no. (>0)	1	median no.	18	max no.	45

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	10	median size	35	max. size	900
Gas in gas fields (bcfg):……min. size	60	median size	210	max. size	5400

Assessment Unit (name, no.)
Southwest Foldbelt, 31540103

AVERAGE RATIOS FOR UNDISCOVERED FIELDS, TO ASSESS COPRODUCTS

(uncertainty of fixed but unknown values)

Oil Fields:	minimum	median	maximum
Gas/oil ratio (cfg/bo)……	1100	2200	3300
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)……	30	40	50
Sulfur content of oil (%)……			
Drilling Depth (m) ……	1000	4000	6000
Depth (m) of water (if applicable)……			

Gas Fields:	minimum	median	maximum
Inert gas content (%)……	1	5	10
CO_2 content (%)……	0.5	2	5
Hydrogen-sulfide content (%)……			
Drilling Depth (m)……	1000	4000	7000
Depth (m) of water (if applicable)……			

Assessment Unit (name, no.)
Southwest Foldbelt, 31540103

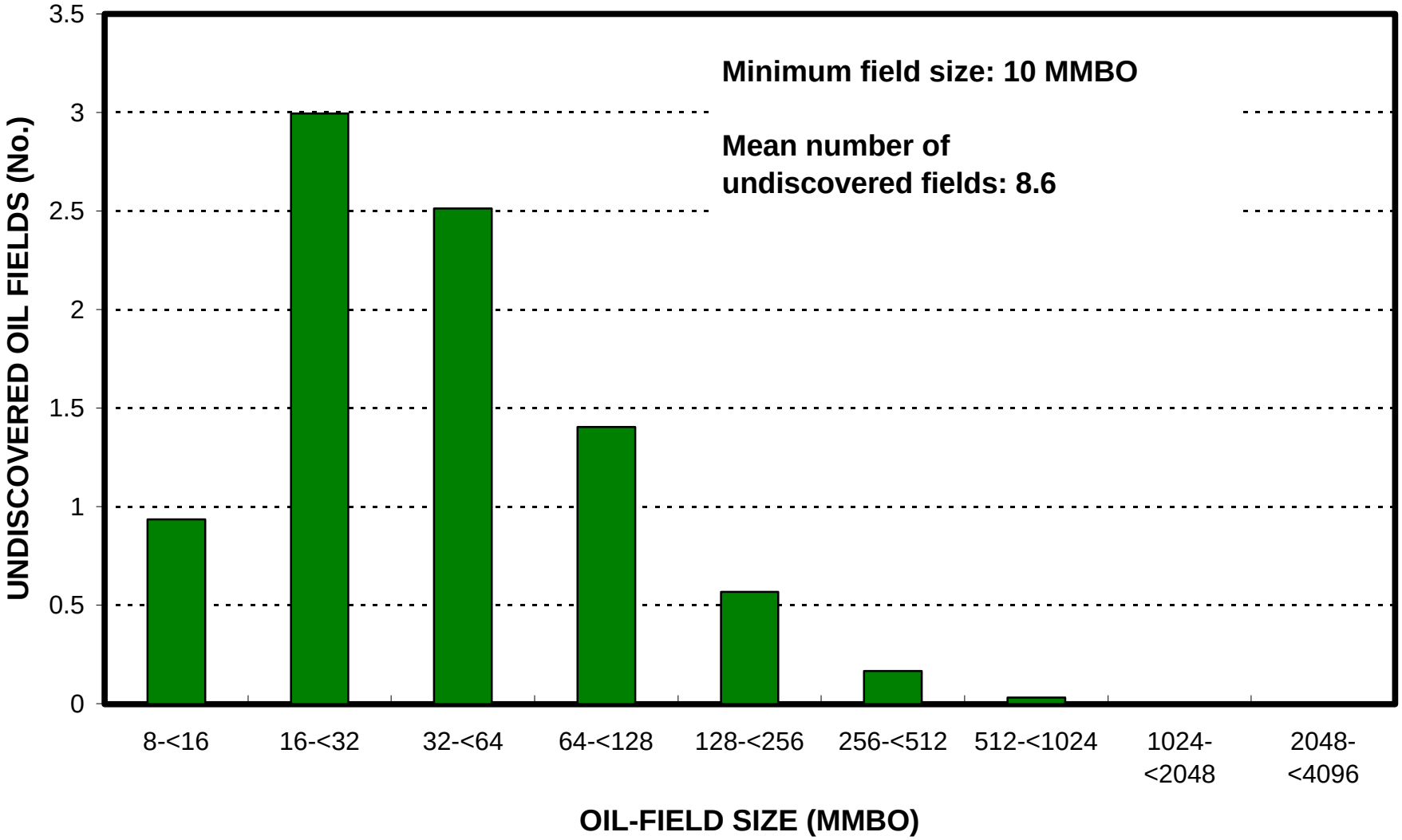
ALLOCATION OF UNDISCOVERED RESOURCES IN THE ASSESSMENT UNIT TO COUNTRIES OR OTHER LAND PARCELS (uncertainty of fixed but unknown values)

1. China 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	

Southwest Foldbelt, AU 31540103
Undiscovered Field-Size Distribution



Southwest Foldbelt, AU 31540103
Undiscovered Field-Size Distribution