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Continuous-Type (Basin-Centered) Gas Assessment Unit 31150301

Continuous-Type (Basin-Centered) Gas Assessment Unit 31150301

Junggar Basin Geologic Province 3115

Geologic Summary

Detailed map of this assessment unit

Assessment Input Data

Assessment Results

This assessment unit was not assessed quantitatively.

USGS PROVINCE: Junggar Basin (3115) **GEOLOGIST:** R.T. Ryder

TOTAL PETROLEUM SYSTEM: Lucaogou/Jurassic Coal-Paleozoic/Mesozoic (311503)

ASSESSMENT UNIT: Continuous-Type (Basin-Centered) Gas (31150301)

DESCRIPTION: The assessment unit is characterized by a continuous-type gas accumulation trapped in a deeply buried pod of mature Permian lacustrine and Jurassic coal source rocks in the central and southern parts of the basin. Permian sandstone beds intercalated with the lacustrine source rocks and Jurassic sandstone beds intercalated with the coal beds are the dominant reservoirs. The gas accumulation is overpressured. The depth to the gas accumulation ranges from about 4,000 to 8,000 m.

SOURCE ROCKS: The source rocks are deep-water lacustrine shale and mudstone of Permian age and coal beds of Early and Middle Jurassic age. The dominant Permian source rocks are the Upper Permian Lucaogou Formation and the Lower Permian Fengchengcheng Formation. The thickness of the Permian source rock sequence ranges from about 700 to 1000 m in the Lucaogou Formation to about 500 m in the Fengchengcheng Formation. The Jurassic coal beds are located in the Sangonghe, Xishanyao, and Toutunhe Formations.

MATURATION: The Lucaogou and Fengchengcheng Formations have been mature with respect to gas generation since about Late Cretaceous time in the deeply buried southern and central parts of the basin. Oil that was generated in the deep part of the basin in the Early Cretaceous has since been transformed to gas. Deeply buried Jurassic coal beds in the southern part of the basin have been mature with respect to gas generation since about the early Miocene. A geothermal gradient of about 22°C/km probably accompanied gas generation.

MIGRATION: Very little vertical and lateral seepage of natural gas has occurred in the pod of mature Permian and Jurassic source rocks.

RESERVOIR ROCK: Primary reservoir rocks consist of low-permeability sandstone and conglomerate of fluvial, alluvial fan, and lacustrine origin in the Upper Permian Ulho and Pindequan Formations and the Middle Triassic Karamay Formation. Secondary reservoir rocks may consist of fractured Permian source rocks and intercalated gravity-flow lacustrine sandstone deposits. Primary Jurassic reservoir rocks consist of fluvial and nearshore lacustrine sandstone in the Songonghe (Lower Jurassic), Xishanyao (Middle Jurassic), and Qigu (Upper Jurassic) Formations. Reservoir quality is generally very poor because of their volcanic litharenite composition of the Permian and Jurassic sandstone.

TRAPS AND SEALS: By analogy to well-documented continuous-type (basin-centered) accumulations, the trap may be a regional zone of high water saturation located updip from the proposed zone of pervasive gas saturation. Shale and mudstone of the Lower Triassic and Lower Cretaceous sequences provide the best regional seals in the basin. Local shale and mudstone seal rocks exist in Upper Permian and Middle/Upper Triassic alluvial plain and lacustrine sequences.

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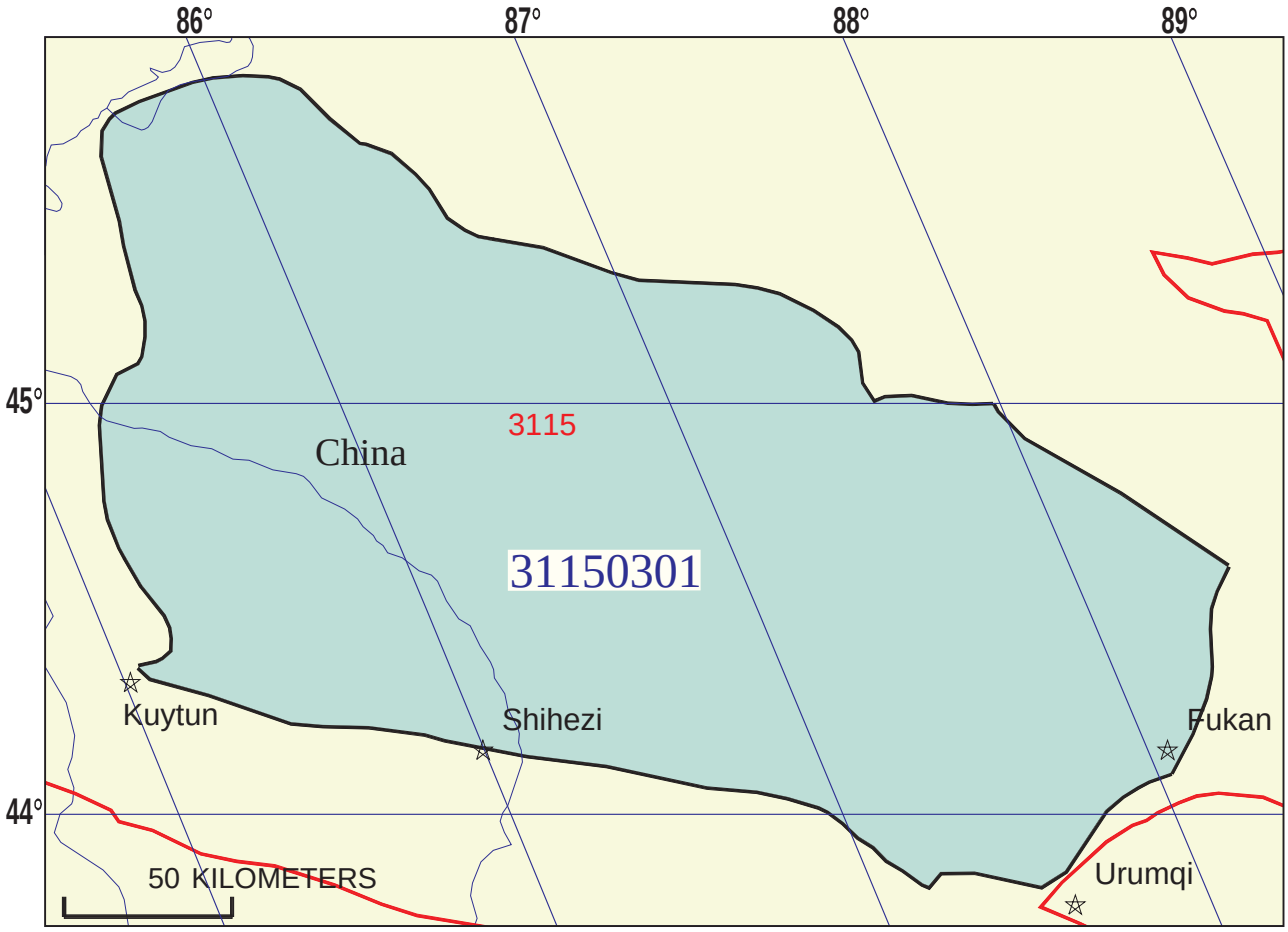

Continuous-Type (Basin-Centered) Gas Assessment Unit - 31150301

EXPLANATION

- Hydrography
- Shoreline
- 3115 — Geologic province code and boundary
- Country boundary
- Gas field centerpoint
- Oil field centerpoint
- 31150301 — Assessment unit code and boundary

Projection: Robinson. Central meridian: 0

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

Date:…….. 5/27/99
Assessment Geologist:…….. R.T. Ryder
Region:…….. Asia Pacific Number: 3
Province:…….. Junggar Basin Number: 3115
Priority or Boutique…… Priority
Total Petroleum System:…… Lucaogou/Jurassic Coal-Paleozoic/Mesozoic Number: 311503
Assessment Unit:…… Continuous-Type (Basin-Centered) Gas Number: 31150301
* 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%)……			