Kuche (Northern) Foldbelt Assessment Unit 31540102



Kuche (Northern) Foldbelt Assessment Unit 31540102

Tarim Basin Geologic Province 3154

USGS PROVINCE: Tarim Basin (3154)

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

ASSESSMENT UNIT: Kuche (Northern) Foldbelt (31540102)

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

SOURCE ROCKS: Source rocks are lacustrine shale and coal beds of the Lower and Middle Jurassic sequence. The thickness of the source rock sequence ranges from about 500 to 1,000 m.

MATURATION: The Jurassic lacustrine shale and coal beds have been mature with respect to oil and gas generation since about the late Neogene (Pliocene). 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 Jurassic source rocks before entrapment in Jurassic, Cretaceous, and Cenozoic sandstone reservoirs. Commonly, oil and gas derived from Jurassic source rocks migrated vertically along thrust faults for several thousands of meters into Cenozoic sandstone reservoirs.

RESERVOIR ROCK: Primary reservoir rocks consist of Jurassic sandstone of fluvial and nearshore lacustrine origin. Reservoir quality of the sandstone is generally very poor because of its volcanic litharenite composition. Sandstone and conglomeratic sandstone reservoirs of Cenozoic and Early Cretaceous age are largely braided fluvial and fan delta 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. The 1000-m-thick, shale, mudstone, and gypsum sequence of Late Cretaceous through Miocene age provides the best regional seal. Also, seal rocks consist of red shale and mudstone units in Upper Jurassic alluvial plain and lacustrine sequences.

REFERENCES:

- Hanson, A.D., 1998, Molecular organic geochemical identification of eight different genetic groups of oils/condensates from the Tarim basin, NW China (abs.): 1998 American Association of Petroleum Geologists Convention Abstract [Salt Lake City, Utah, May 17-28, 1998], PDF 271.
- Hu B.L., 1992, Petroleum geology and prospects of the Tarim (Talimu) basin, China, *in* Halbouty, M.T., ed., Giant oil and gas fields of the decade 1978 to 1988: American Association of Petroleum Geologists Memoir 54, p. 493-510.
- Li D.S., Liang D.G., Jia C.Z., Wang G., Wu Q.Z., and He D.F., 1996, Hydrocarbon accumulations in the Tarim basin, China: American Association of Petroleum Geologists Bulletin, v. 80, no. 10, p. 1587-1603.

- Nishidai, T., and Berry, J.L., 1990, Structure and hydrocarbon potential of the Tarim basin, NW China from satellite imagery: Journal of Petroleum Geology, v. 15, no. 1, p. 5-34.
- Wang Q.M., Nishidai, T., and Coward, M. P., 1992, The Tarim basin, NW China–Formation and aspects of petroleum geology: Journal of Petroleum Geology, v. 15, no. 1, p. 5-34.



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-Pha	anerozoic			Number:	315401
Assessment Unit:	Kuche (Northern) Foldb	elt			Number:	31540102
* Notes from Assessor	MMS growth function.					
	CHARACTERISTICS	S OF ASSE	SSMENT UNIT	-		
Oil (<20,000 cfg/bo overall) <u>o</u>	<u>r</u> Gas (<u>></u> 20,000 cfg/bo ov	verall):	Gas			
What is the minimum field size (the smallest field that has pot	ential to be added to rese	mmboe gr erves in the	own (<u>></u> 1mmboe next 30 years)	9)		
Number of discovered fields e	xceeding minimum size:.		Oil:	1	Gas:	1
Established (>13 fields)	Frontier (1	-13 fields)	ХНу	pothetical	(no fields)	
Median size (grown) of discov	ered oil fields (mmboe):				0.4.0.4	
Median size (grown) of discov	ered ass fields (bofa):				310 310	<u> </u>
Wedian size (grown) of discov	1st 3rd		2nd 3rd		3rd 3rd	
Assessment-Unit Probabiliti	es:					
Attribute			<u>Pi</u>	obability	of occurrence	<u>ce (0-1.0)</u>
1. CHARGE: Adequate petrol	eum charge for an undis	covered fie	ld <u>></u> minimum s	ize		1.0
2. ROCKS: Adequate reserve	ors, traps, and seals for a		ered field <u>></u> mir	nimum siz	e	1.0
3. TIMING OF GEOLOGIC EV	ENIS: Favorable uming	for an und	iscovered lield	<u>></u> minimu	m size	1.0
Assessment-Unit GEOLOGI	C Probability (Product of	f 1, 2, and 3	3):		1.0	
	te location to allow exploi	ration for a	oundiscovered	field		
> minimum size				liciu		1.0
<u>-</u>						
	UNDISCO					
Number of Undiscovered Fie	elds: How many undisco	vered field	s exist that are	> minimu	m size?:	
	(uncertainty of	fixed but u	nknown values))		
Oil fields:	min. no. (>0)	1	_median no	3	max no.	5
Gas fields:	min. no. (>0)	5	_median no	20	max no.	50
Size of Undiscovered Fields	: What are the anticipate (variations in the s	ed sizes (gr sizes of und	rown) of the ab	ove fields s)	?:	
Oil in oil fields (mmbo)	min size	10	median size	20	max. size	400
Gas in gas fields (bcfg):	min. size	60	median siz	300	max. size	7000

Assessment Unit (name, no.) Kuche (Northern) Foldbelt, 31540102

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
<u>Gas fields:</u> Liquids/gas ratio (bngl/mmcfg) Oil/gas ratio (bo/mmcfg)	minimum 22	median 44	maximum 66

SELECTED ANCILLARY DATA FOR UNDISCOVERED FIELDS

(variations in the properties of undiscovered fields)

<u>Oil Fields:</u>	minimum	median	maximum
API gravity (degrees)	30	40	50
Sulfur content of oil (%)			
Drilling Depth (m)	500	1000	2000
Depth (m) of water (if applicable)			
Gas Fields	minimum	median	maximum
Inert das content (%)	1	5	10
CO_2 content (%)	0.5	2	5
Hydrogen-sulfide content (%)			
Drilling Depth (m)	500	1500	3500
Depth (m) of water (if applicable)			

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

TO COUNTRIES OR OTHER LAND PARCELS (uncertainty of fixed but unknown values)

1. China repres	ents <u>100</u> areal	100 areal % of the total assessment unit			
<u>Oil in Oil Fields:</u> Richness factor (unitless multiplier):	minimum	median	maximum		
Volume % in parcel (areal % x richness factor) Portion of volume % that is offshore (0-100%)		<u> 100 </u> 0			
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%)		<u> </u>			



OIL-FIELD SIZE (MMBO)

Kuche (Northern) Foldbelt, AU 31540102 Undiscovered Field-Size Distribution



GAS-FIELD SIZE (BCFG)