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Lower Kura Depression and Adjacent Shelf Assessment Unit 11120102

Lower Kura Depression and Adjacent Shelf Assessment Unit 11120102

South Caspian Basin Geologic Province 1112

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: South Caspian Basin (1112) **GEOLOGIST:** L.S. Smith-Rouch

TOTAL PETROLEUM SYSTEM: Oligocene-Miocene Maykop/Diatom (111201)

ASSESSMENT UNIT: Lower Kura Depression and Adjacent Shelf (11120102)

DESCRIPTION: The unit lies in the western sector of the South Caspian Basin south of the Greater Caucasus and is bordered on the south by the Lesser Caucasus accretionary complex. The eastern boundary is with the buckle fold and shale diapir structural zone of the central Caspian deep-water area. Most of the unit area is in Azerbaijan with 60 percent of the area offshore and 40 percent onshore. The unit has abundant active mud volcanoes both onshore and offshore. Onshore fields are strongly faulted resulting from Caucasus's tectonics.

SOURCE ROCK: The source rocks are anoxic marine shales of Oligocene-lower Miocene Maykop series and the overlying middle-upper Miocene Diatom Formation. The source rocks contain primarily Type II kerogen and extend throughout the entire basin. Total organic carbon content in the rocks is as high as 10 percent and the Hydrogen Index values range from 150 to 500 mg hydrocarbons/g organic carbon.

MATURATION: Early-middle Pliocene rapid subsidence and high sedimentation rates (2.9 m/ky) drove early maturation. This assessment unit may have developed the earliest hydrocarbon generation in the basin. A younger pulse of generation occurred in Pleistocene time.

MIGRATION: Two major pulses of hydrocarbon generation and expulsion were identified: (1) pre-Akchagylian and (2) post-Akchagylian. Pre-Akchagylian generation occurred in the eastern offshore area and hydrocarbons were accumulated in structures in the north and west but passed through the southern area before adequate traps were formed (Hamamdag trend). A second-generation pulse developed in the northern section in post-Akchagylian time. Hydrocarbons migrated south to provide additional fill to the structures that were partially filled during the pre-Akchagylian pulse.

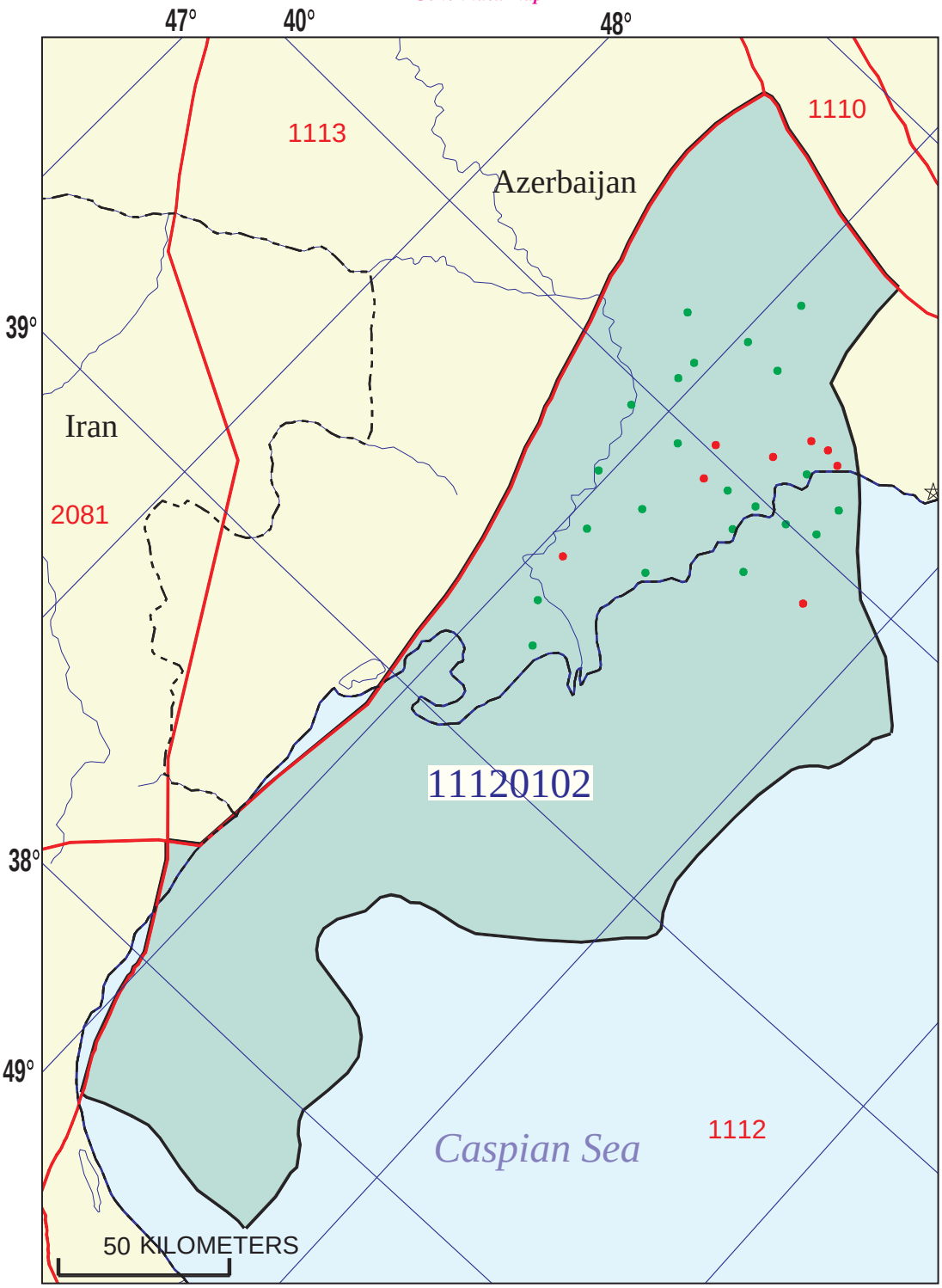
RESERVOIR ROCKS: Reservoir rocks are primarily volcano clastic and feldspar rich paleo-Kura river sediments of the lower-middle Pliocene Productive series. Minor production is from reservoirs in Oligocene to early Miocene and late Pliocene age. These reservoirs are of poorer quality than paleo-Volga river sediments to the north due to the greater clay content. Locally more than 30 horizons are productive in individual fields.

TRAPS AND SEALS: Traps are compressional anticlines that were formed mainly in late Pliocene time. Seals are intraformational shales throughout the Productive series isolating individual sandstone reservoir horizons.

REFERENCES:

Abrams, M.A., and Narimanov, A. A., 1997, Geochemical evaluation of hydrocarbons and their potential sources in the western South Caspian depression, Republic of Azerbaijan: Marine and Petroleum Geology, v. 14, no. 4, p. 451-468.

Devin, W.J., Cogswell, J.J., Gaskins, G.M., Isaksen, G.H., Pitcher, D.M., Puls, D.P., Stanley, K.O., Wall, G.R.T., 1999, South Caspian Basin–Young, cool, and full of promise: GSA Today, v. 9, no. 7, p. 1-9.



Lower Kura Depression and Adjacent Shelf Assessment Unit - 11120102

EXPLANATION

- Hydrography
- Shoreline
- 1112 — Geologic province code and boundary
- Country boundary
- Gas field centerpoint
- Oil field centerpoint
- 11120102 — Assessment unit code and boundary

Projection: Equidistant Conic. Central meridian: 100. Standard Parallel: 58 30

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

Date:……..	1/11/00		
Assessment Geologist:……..	G.F. Ulmishek		
Region:……..	Former Soviet Union	Number:	1
Province:……..	South Caspian Basin	Number:	1112
Priority or Boutique……	Priority		
Total Petroleum System:……	Oligocene-Miocene Maykop/Diatom	Number:	111201
Assessment Unit:……	Lower Kura Depression and Adjacent Shelf	Number:	11120102
* Notes from Assessor	No growth factor used.		

CHARACTERISTICS OF ASSESSMENT UNIT

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

What is the minimum field size?……. 5 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: 16 Gas: 4
Established (>13 fields) X Frontier (1-13 fields) _____ Hypothetical (no fields) _____

Median size (grown) of discovered oil fields (mmboe):
1st 3rd 15 2nd 3rd 148.5 3rd 3rd 35
Median size (grown) of discovered gas fields (bcfg):
1st 3rd 484 2nd 3rd 1498.5 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)	2	median no.	20	max no.	40
Gas fields:……min. no. (>0)	3	median no.	40	max no.	80

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	5	median size	30	max. size	1500
Gas in gas fields (bcfg):……min. size	30	median size	250	max. size	25000

Assessment Unit (name, no.)
Lower Kura Depression and Adjacent Shelf, 11120102

AVERAGE RATIOS FOR UNDISCOVERED FIELDS, TO ASSESS COPRODUCTS

(uncertainty of fixed but unknown values)

Oil Fields:	minimum	median	maximum
Gas/oil ratio (cfg/bo)……	1500	3000	4500
NGL/gas ratio (bngl/mmcfg)……	30	60	90

Gas fields:	minimum	median	maximum
Liquids/gas ratio (bngl/mmcfg)……	20	35	50
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	52
Sulfur content of oil (%)……		0	
Drilling Depth (m) ……	3000	4500	7000
Depth (m) of water (if applicable)……	0	100	300

Gas Fields:	minimum	median	maximum
Inert gas content (%)……	0.5	0.8	1.5
CO_2 content (%)……	0.2	0.6	1.2
Hydrogen-sulfide content (%)……		0	
Drilling Depth (m)……	3000	4500	7000
Depth (m) of water (if applicable)……	0	100	300

Assessment Unit (name, no.)
Lower Kura Depression and Adjacent Shelf, 11120102

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

1. Azerbaijan represents 88 areal % of the total assessment unit

Oil in Oil Fields:	minimum	median	maximum
Richness factor (unitless multiplier):……			
Volume % in parcel (areal % x richness factor):…		88	
Portion of volume % that is offshore (0-100%)……		95	

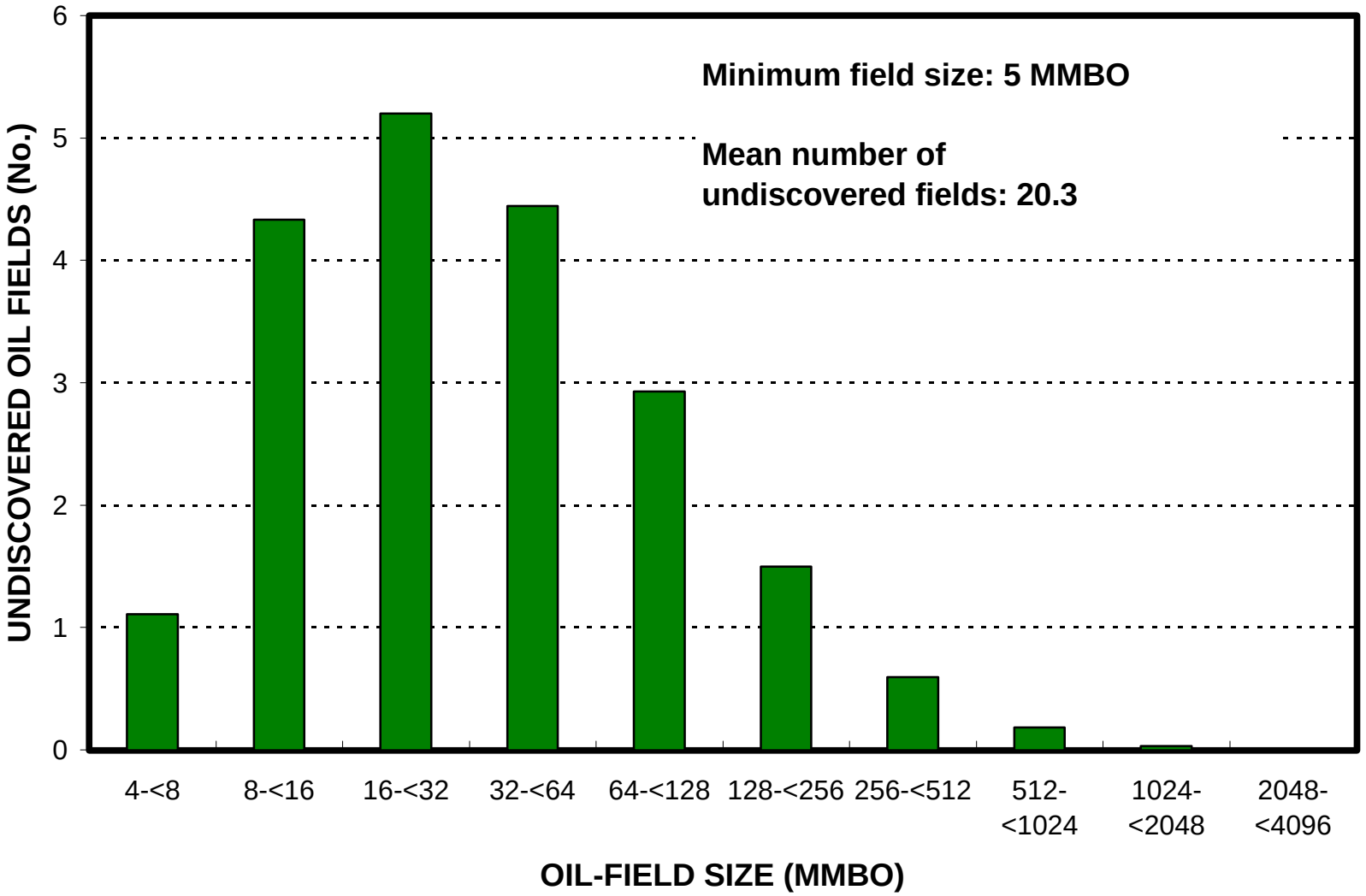
Gas in Gas Fields:	minimum	median	maximum
Richness factor (unitless multiplier):……			
Volume % in parcel (areal % x richness factor):…		88	
Portion of volume % that is offshore (0-100%)……		95	

2. Iran represents 12 areal % of the total assessment unit

Oil in Oil Fields:	minimum	median	maximum
Richness factor (unitless multiplier):……			
Volume % in parcel (areal % x richness factor):…		12	
Portion of volume % that is offshore (0-100%)……		100	

Gas in Gas Fields:	minimum	median	maximum
Richness factor (unitless multiplier):……			
Volume % in parcel (areal % x richness factor):…		12	
Portion of volume % that is offshore (0-100%)……		100	

Lower Kura Depression and Adjacent Shelf, AU 11120102
Undiscovered Field-Size Distribution



Lower Kura Depression and Adjacent Shelf, AU 11120102
Undiscovered Field-Size Distribution