Go to Table of Contents

Go to index map

Lower Volga
Assessment Unit 10150102

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Volga-Ural Region Geologic Province 1015

USGS PROVINCE: Volga-Ural Region (1015) **GEOLOGIST:** G.F. Ulmishek

PETROLEUM SYSTEM: Volga-Ural Domanik-Paleozoic (101501)

ASSESSMENT UNIT: Lower Volga (10150102)

DESCRIPTION: This assessment unit encompasses the province area south of the Zhigulev-Pugachev arch and includes the entire sedimentary sequence. The unit is maturely explored. Major oil reserves are in Devonian clastic and carbonate reservoirs and major gas reserves are in Carboniferous and Devonian clastics.

SOURCE ROCKS: Source rocks are siliceous shales and carbonates of the Frasnian Rudkin Formation correlative with Domanik Formation of more northern regions. Some gas possibly has migrated updip from the adjacent North Caspian basin into Carboniferous reservoirs.

MATURATION: No maturation data are available. Probably, Domanik source rocks are in the lower part of oil window over most of the area and dip into gas window eastward, toward the North Caspian basin boundary.

MIGRATION: In addition to short-distance lateral and vertical migration, long-distance lateral migration updip in the westward direction is feasible.

RESERVOIR ROCKS: Main oil and gas reserves are found in Middle Devonian sandstones, Frasnian carbonates (mainly reefs), and Visean and lower Moscovian sandstones. Future potential is mostly related to Devonian carbonates and clastics.

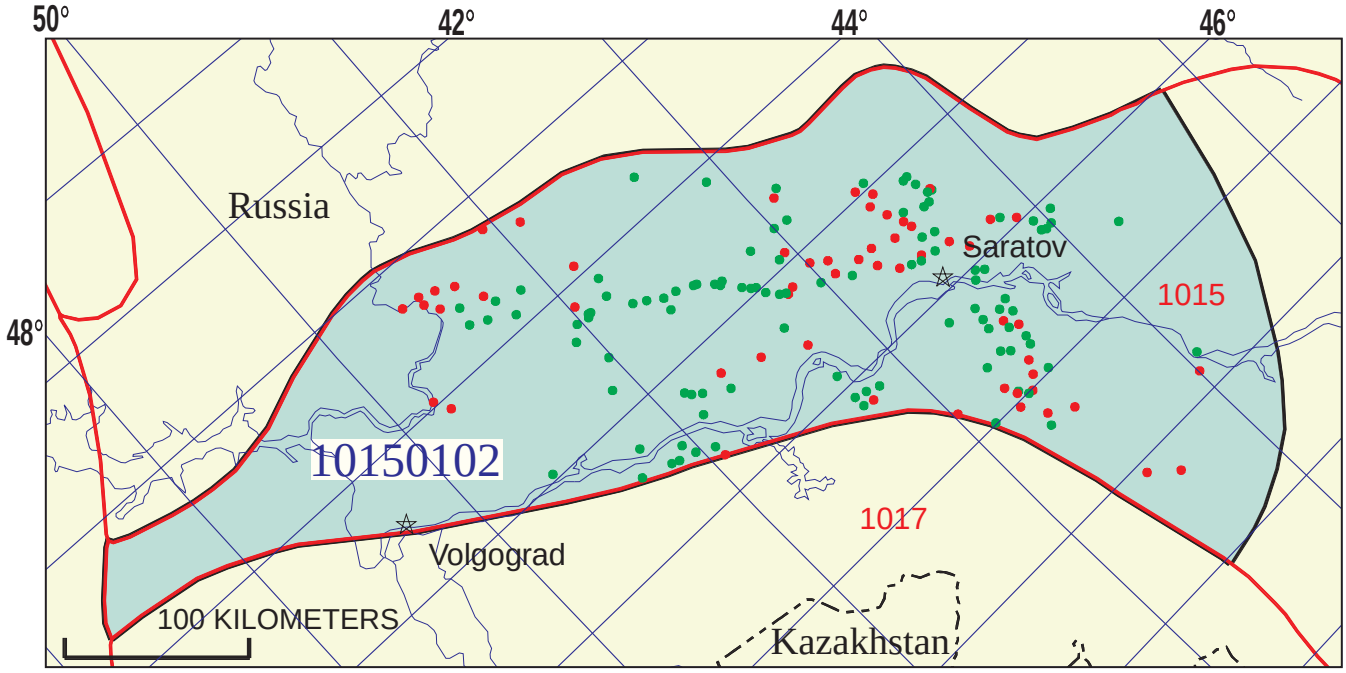
TRAPS: Anticlinal traps contain the majority of hydrocarbon reserves. Older anticlines are developed over basement uplifts and contain mostly oil. Younger structural traps overlie inverted Devonian grabens and contain mostly gas. Significant oil reserves are found in pinnacle reefs on margins of the Umetov-Linev depression.

REFERENCES:

Burunkov, V.A., and Rusetskaya, N.N., 1998, Main results and tasks of regional investigations in Lower Volga region: Petroleum Geology, v. 32, no. 4, p. 397-401.

Seyful-Mulyukov, R.B., 1979, Paleotectonics and genesis of oil (Paleotektonika i genezis nefti): Moscow, Nedra, 216 p.

Seyful-Mulyukov, R.B., ed., 1963, Geology and petroleum potential of the southeastern Russian platform (Geologiya i neftegazonosnost yugo-vostoka Russkoy platformy), Trudy NILNeftegaz, v. 10: Leningrad, Gostoptekhizdat, 355 p.



Lower Volga
Assessment Unit - 10150102

EXPLANATION

- Hydrography
- Shoreline
- 1015 Geologic province code and boundary
- Country boundary
- Gas field centerpoint
- Oil field centerpoint
- 10150102 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:……..	6/3/99		
Assessment Geologist:……..	G.F. Ulmishek		
Region:……..	Former Soviet Union	Number:	1
Province:……..	Volga-Ural Region	Number:	1015
Priority or Boutique……	Priority		
Total Petroleum System:……	Volga-Ural Domanik-Paleozoic	Number:	101501
Assessment Unit:……..	Lower Volga	Number:	10150102
* Notes from Assessor	Fields not grown. Inert gas is nitrogen.		

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: 80 Gas: 44
Established (>13 fields) X Frontier (1-13 fields) _____ Hypothetical (no fields) _____

Median size (grown) of discovered oil fields (mmboe):
1st 3rd 13 2nd 3rd 10 3rd 3rd 5
Median size (grown) of discovered gas fields (bcfg):
1st 3rd 71 2nd 3rd 52 3rd 3rd 31

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)	10	median no.	30	max no.	50
Gas fields:……min. no. (>0)	5	median no.	15	max no.	25

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	480

Assessment Unit (name, no.)
Lower Volga, 10150102

AVERAGE RATIOS FOR UNDISCOVERED FIELDS, TO ASSESS COPRODUCTS

(uncertainty of fixed but unknown values)

Oil Fields:	minimum	median	maximum
Gas/oil ratio (cfg/bo)……	400	750	1200
NGL/gas ratio (bngl/mmcfg)……	30	60	90

Gas fields:	minimum	median	maximum
Liquids/gas ratio (bngl/mmcfg)……	20	30	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)……	32	40	46
Sulfur content of oil (%)……	0.2	0.3	0.4
Drilling Depth (m) ……	1500	3700	5000
Depth (m) of water (if applicable)……			

Gas Fields:	minimum	median	maximum
Inert gas content (%)……	1	6	20
CO_2 content (%)……	0.2	1	4
Hydrogen-sulfide content (%)……	0	0.1	0.3
Drilling Depth (m)……	1500	4000	5200
Depth (m) of water (if applicable)……			

Assessment Unit (name, no.)
Lower Volga, 10150102

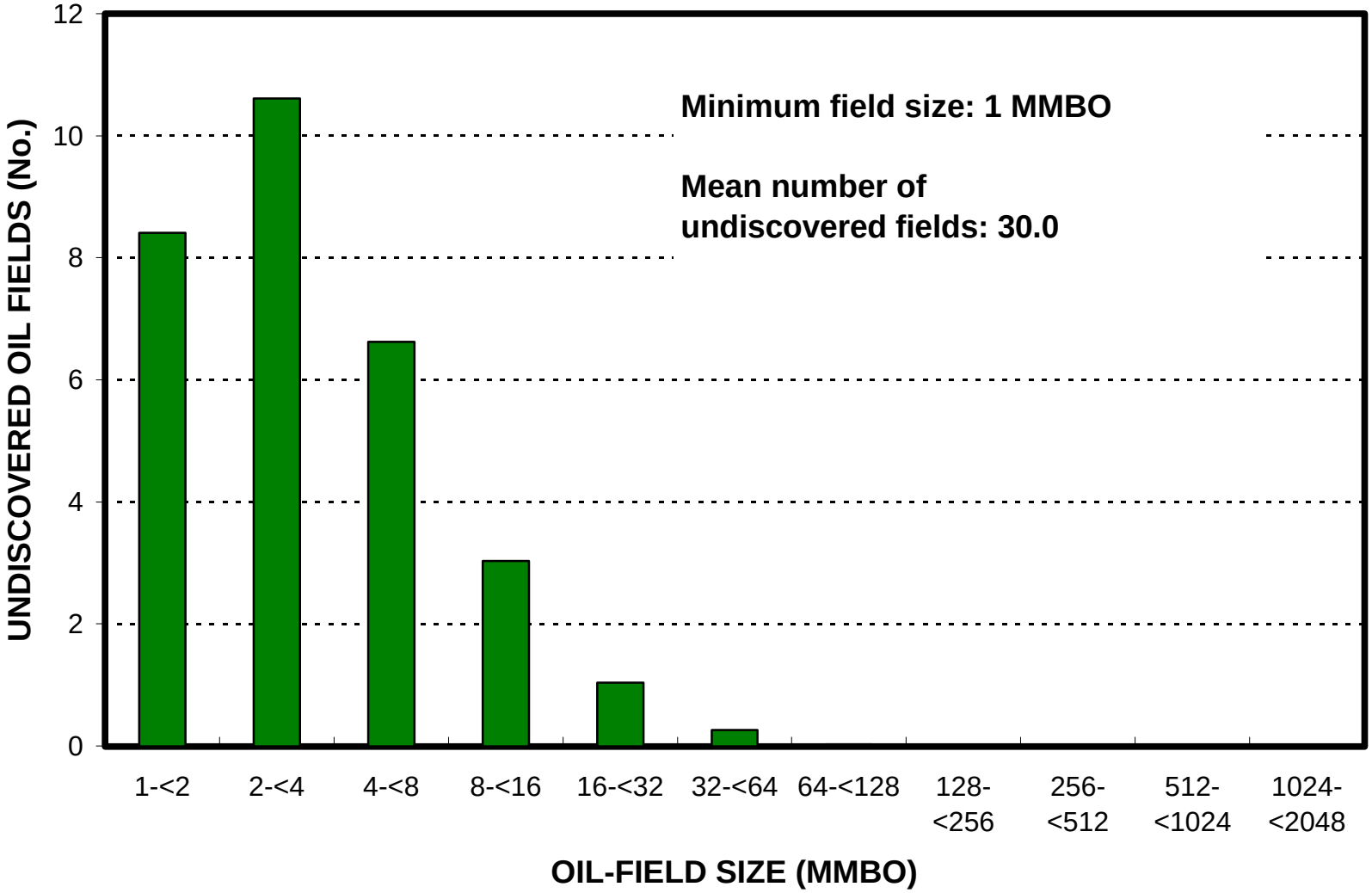
ALLOCATION OF UNDISCOVERED RESOURCES IN THE ASSESSMENT UNIT TO COUNTRIES OR OTHER LAND PARCELS (uncertainty of fixed but unknown values)

1. Russia 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	

Lower Volga, AU 10150102
Undiscovered Field-Size Distribution



Lower Volga, AU 10150102
Undiscovered Field-Size Distribution