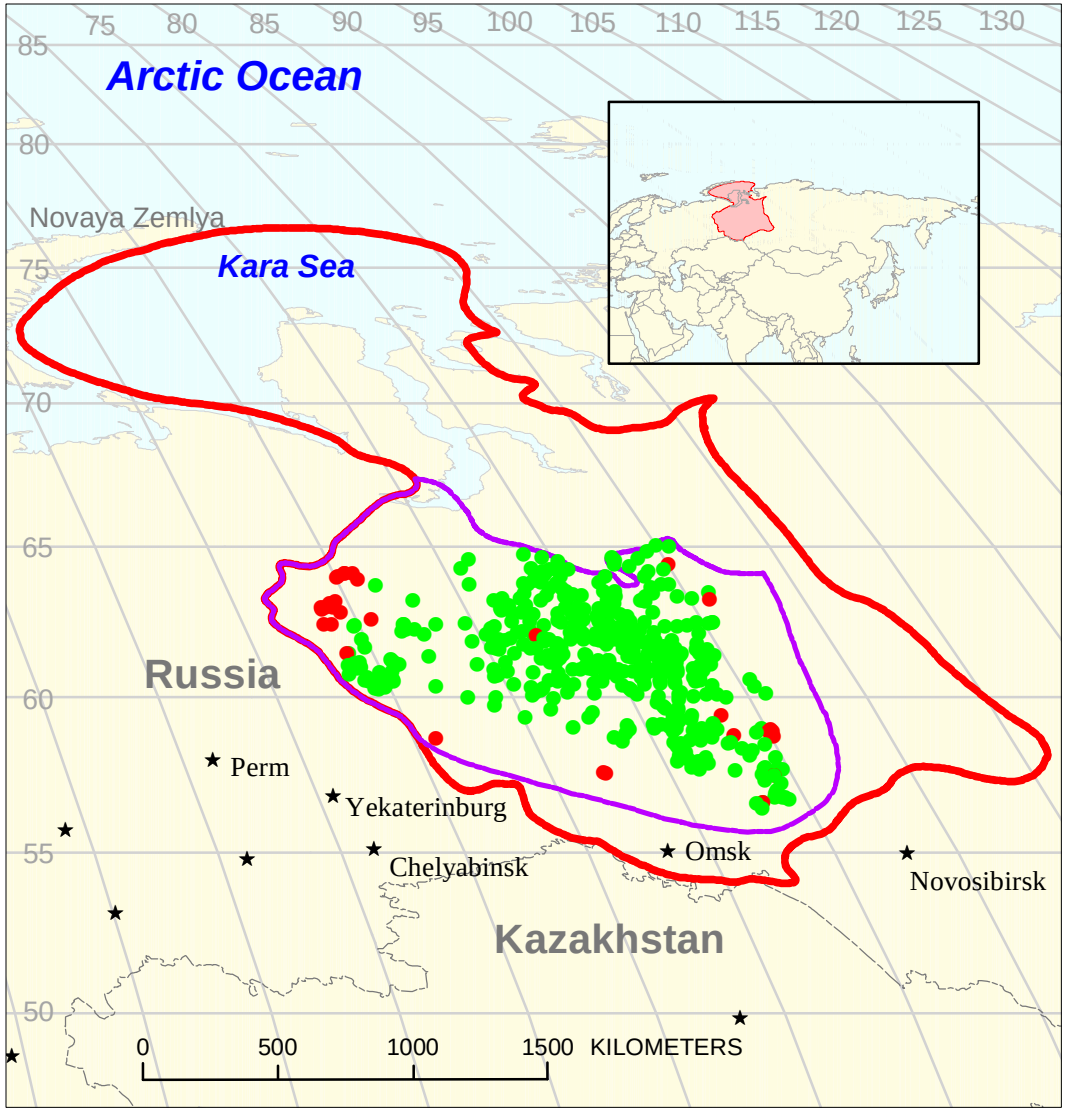
Go to Table of Contents

Go to index map

Upper Jurassic-Cretaceous Sandstones Assessment Unit 11740101



Upper Jurassic-Cretaceous Sandstones Assessment Unit 11740101

West Siberian Basin Geologic Province 1174

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: West Siberian Basin (1174) **GEOLOGIST:** G.F. Ulmishek

PETROLEUM SYSTEM: Bazhenov-Neocomian (117401)

ASSESSMENT UNIT: Upper Jurassic-Cretaceous Sandstones (11740101)

DESCRIPTION: The assessment unit includes clastic rocks in the stratigraphic interval from the Upper Jurassic through the Cenomanian over the entire area of the petroleum system. The unit contains the principal oil reserves of West Siberia. Most of these reserves are concentrated in Neocomian rocks of the Middle Ob region.

SOURCE ROCKS: The source rocks are of very high quality. They are deep-marine, siliceous, calcareous, bituminous shales and siliciliths of the Volgian-lower Berriasian Bazhenov Formation. The formation is 20 to 50 m thick and contains 5 to 20 percent TOC. The kerogen is of Type II.

MATURATION: The Bazhenov Formation is presently in the oil window zone over most of the petroleum system area. Maximum maturity was achieved in the Oligocene.

MIGRATION: Bazhenov oil migrated downward into Upper Jurassic sandstones and upward into Neocomian sandstones. Downward migration was across a relatively thin shale bed. Avenues for upward migration apparently were tilted turbidite beds of the Neocomian Achimov Formation.

RESERVOIR ROCKS: Principal Neocomian reservoir rocks are sandstones and siltstones of the deltaic progradational system that filled the Bazhenov deep-water marine basin. Reservoir properties are variable and depend on sandstone facies that vary from shallow shelf to slope to basinal turbidite fans. Upper Jurassic reservoir rocks are shallow-shelf marine sandstones that are usually not thick, but possess rather good reservoir properties.

TRAPS: Most of hydrocarbon reserves are in structural traps that are preferentially concentrated on large regional arches. Numerous stratigraphic traps related to cyclic deposition of sands in the progradational system are also present.

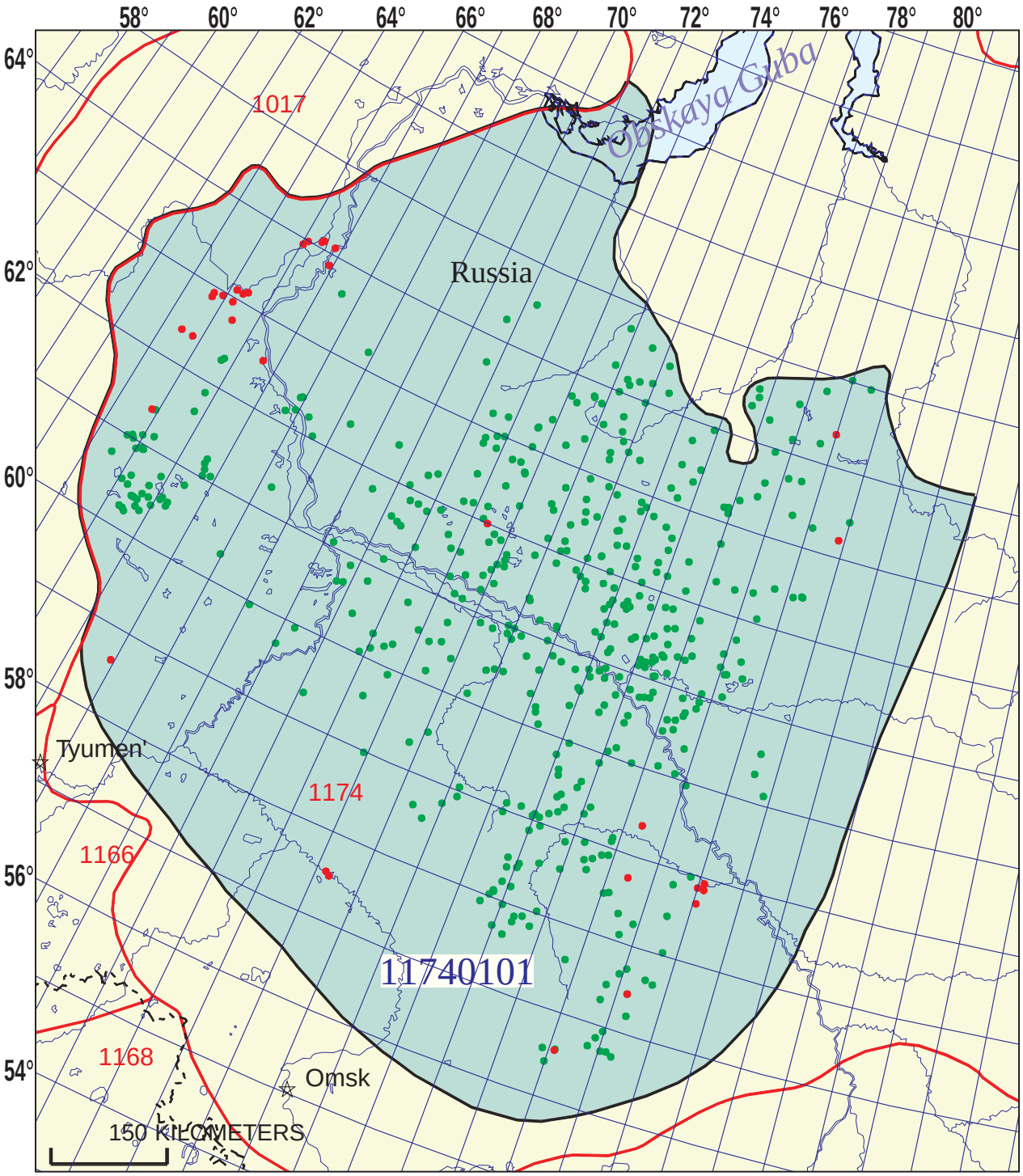
SEALS: Overpressured Bazhenov shales constitute a regional seal for pools in Upper Jurassic rocks. Intraformational shale beds seal numerous pools in the highly productive Neocomian sequence, but the entire sequence is regionally overlain by thick lower Aptian shale formations. Locally, the Aptian seal is breached and hydrocarbon pools are found in Cenomanian sandstones under the regional Turonian seal.

REFERENCES:

Kontorovich, A.E., Moskvin, V.I., Bostrikov, O.I., Danilova, V.P., Fomin, A.N., Fomichev, A.S., Kostyreva, E.A., and Melenevsky, V.N., 1996, Main oil source formations of the West Siberian basin: Petroleum Geoscience, v. 3, no. 4, p. 343-358.

Rudkevich, M.Ya., Ozeranskaya, L.S., Chistyakova, H.F., Kornev, V.A., and Maksimov, E.M., 1988, Petroleum-productive complexes of the West Siberian basin (Neftegazonosnye kompleksy Zapadno-Sibirskogo basseyna): Moscow, Nedra, 304 p.

Peters, K.E., Kontorovich, A.E., Huizinga, B.J., Moldowan, J.M., and Lee, C.Y., 1994, Multiple oil families in the West Siberian basin: American Association of Petroleum Geologists Bulletin, v. 78, no. 6, p. 893-909.



Upper Jurassic-Cretaceous Sandstones Assessment Unit - 11740101

EXPLANATION

- Hydrography
- Shoreline
- 1174 — Geologic province code and boundary
- Country boundary
- Gas field centerpoint
- Oil field centerpoint
- 11740101 — Assessment unit code and boundary

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

USGS science for a changing world

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

Date:……..	12/6/99		
Assessment Geologist:……..	G.F. Ulmishek		
Region:……..	Former Soviet Union	Number:	1
Province:……..	West Siberian Basin	Number:	1174
Priority or Boutique……	Priority		
Total Petroleum System:……	Bazhenov-Neocomian	Number:	117401
Assessment Unit:……..	Upper Jurassic-Cretaceous Sandstones	Number:	11740101
* Notes from Assessor	No standard U.S. growth functions were applied; however, field growth is recognized.		

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: 353 Gas: 27
Established (>13 fields) X Frontier (1-13 fields) _____ Hypothetical (no fields) _____

Median size (grown) of discovered oil fields (mmboe):
1st 3rd 50 2nd 3rd 40 3rd 3rd 15
Median size (grown) of discovered gas fields (bcfg):
1st 3rd 140 2nd 3rd 72 3rd 3rd 200

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)	100	median no.	1000	max no.	2500
Gas fields:……min. no. (>0)	5	median no.	20	max no.	50

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	12	max. size	2200
Gas in gas fields (bcfg):……min. size	30	median size	60	max. size	3000

Assessment Unit (name, no.)
Upper Jurassic-Cretaceous Sandstones, 11740101

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)……	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)……	20	35	55
Sulfur content of oil (%)……	0.2	1.2	2.2
Drilling Depth (m) ……	1000	2500	3500
Depth (m) of water (if applicable)……			

Gas Fields:	minimum	median	maximum
Inert gas content (%)……	1	2	6
CO_2 content (%)……	0.2	0.5	1.5
Hydrogen-sulfide content (%)……	0	0	0
Drilling Depth (m)……	1500	2000	3000
Depth (m) of water (if applicable)……			

Assessment Unit (name, no.)
Upper Jurassic-Cretaceous Sandstones, 11740101

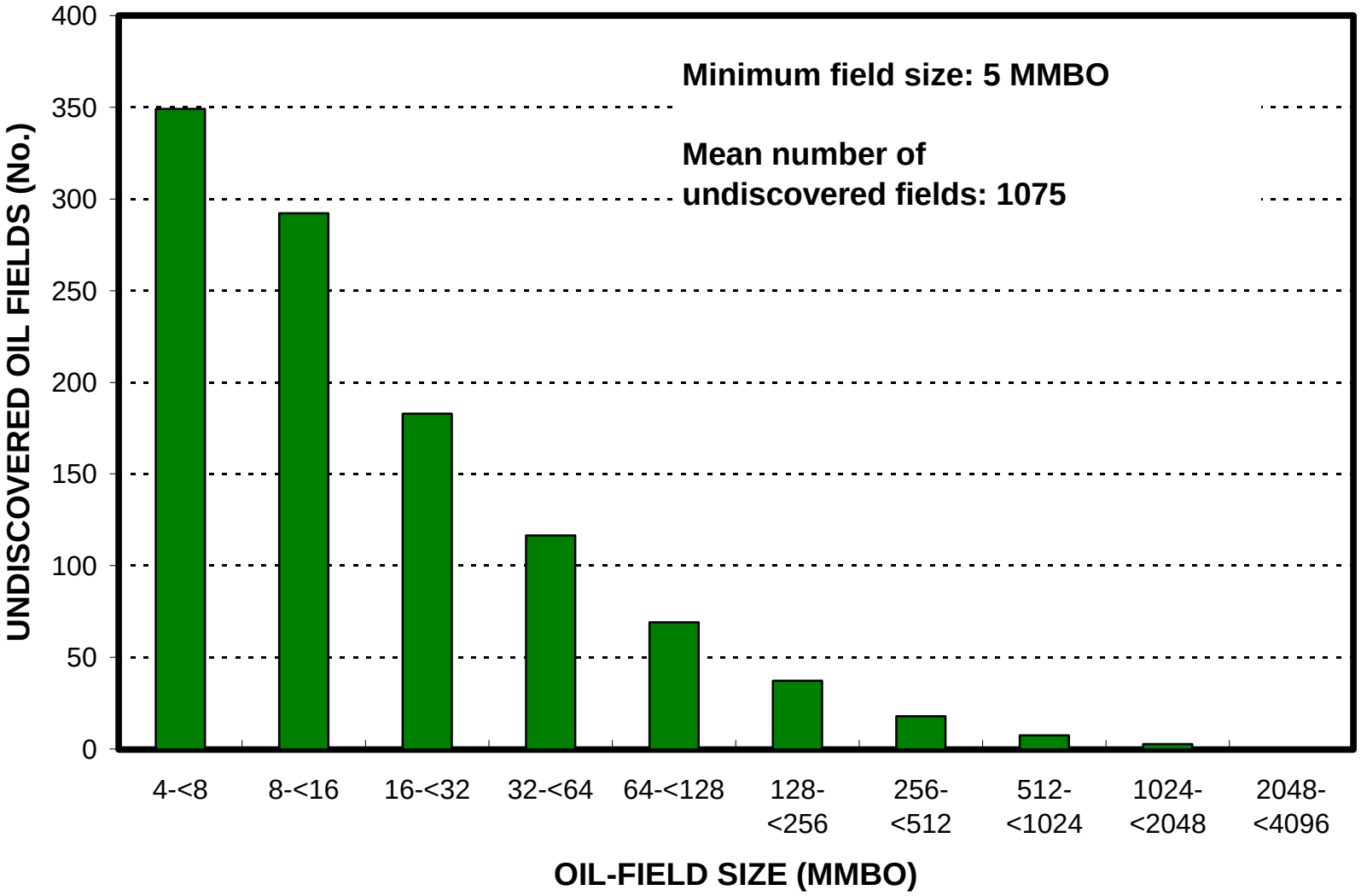
ALLOCATION OF UNDISCOVERED RESOURCES IN THE ASSESSMENT UNIT TO COUNTRIES OR OTHER LAND PARCELS (uncertainty of fixed but unknown values)

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	

Upper Jurassic-Cretaceous Sandstones, AU 11740101
Undiscovered Field-Size Distribution



Upper Jurassic-Cretaceous Sandstones, AU 11740101
Undiscovered Field-Size Distribution