



# Transcarpathian Basin Assessment Unit 40480401



-  Transcarpathian Basin Assessment Unit 40480401
-  Pannonian Basin Geologic Province 4048

**USGS PROVINCE:** Pannonian Basin (4048)

**GEOLOGIST:** G.L. Dolton

**TOTAL PETROLEUM SYSTEM:** Transcarpathian Neogene (404804)

**ASSESSMENT UNIT:** Transcarpathian Basin (40480401)

**DESCRIPTION:** This assessment unit consists of traps and accumulations in the Cenozoic basin fill of the Transylvanian basin, which have been charged by Miocene organic-rich rocks. Structural, stratigraphic and combination traps, include growth faults, compaction features over basement highs, pinchouts in fluvial, shallow water, and turbidite sandstones and conglomerates, and unconformity traps. Significant vertical migration characterizes this unit; included in the assessment unit are reservoir rocks of the underlying Mesozoic basement and Paleogene.

**SOURCE ROCKS:** Inferred source rocks are Miocene and of early Karpathian, Badenian and early Sarmation ages. Their average concentration of organic matter is less than 1 to 1.3 percent, and kerogen is mainly humic; however, the known hydrocarbons are seemingly derived from the Tertiary source rocks as Pre-Tertiary rocks were overmature prior to the Paleogene. Contributions from Paleogene rocks remain unknown.

**MATURATION:** Maturation of source rocks in the central part of the basin appears to have been reached prior to Pliocene sedimentation. Gas is generally accompanied by CO<sub>2</sub>. Biogenic methane occurs in shallow reservoirs at depths less than 1.2 km.

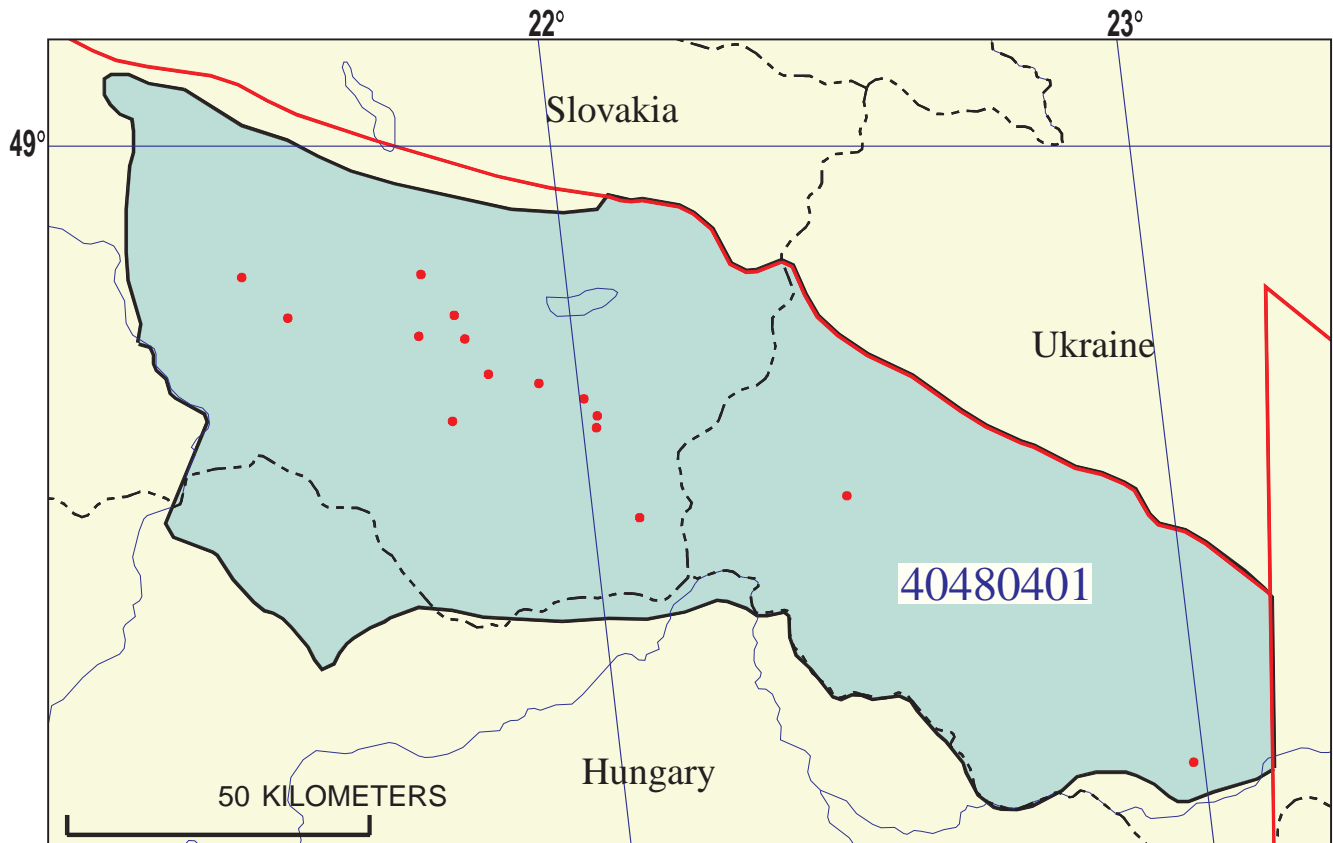
**MIGRATION:** Timing of migration is favorable with reference to trap formation. Vertical migration appears pervasive. In addition to conventional fields, hydrocarbon shows are also reported on the slopes of buried stratovolcanoes.

**RESERVOIR ROCKS:** Principal reservoirs are sandstones in the Miocene lower Sarmatian and upper Badenian sequences. Potential reservoirs include marls and biohermal buildups (patch reefs) in the Neogene. Dolomites in the Mesozoic basement nappes are productive in a single case, and Paleogene sandstones in two fields.

**TRAPS AND SEALS:** Traps include structural, stratigraphic and combination traps, including growth faults, compaction features over basement highs and pinchouts in fluvial, shallow water, and turbidite sandstones and conglomerates, and unconformity traps. Most are compactional anticlines above basement highs and positive structures along faults. The development of the basin has been strongly affected by syndimentary faults and by volcanic activity. Trap development in the basin has been influenced by the presence of salt layers and differential compaction. Neogene reservoirs are covered and sealed by thick complexes of clays or salt layers. Basement traps include paleotopographic highs, structures and unconformity traps beneath the Tertiary. They are sealed by fine-grained Tertiary rocks.

**REFERENCES:**

- Blizkovsky, M., Kocak, A., Morkovsky, M., Novotny, A., Gaza, B., Kostelnicek, P., Hlavaty, V., Lunga, S., Vass, D., Francu, J. and Muller, P., 1994, Exploration history, geology and hydrocarbon potential in the Czech Republic and Slovakia, Chapter 3, *in* Popescu, B.M., ed., Hydrocarbons of eastern central Europe–Habitat, exploration and production history: Berlin, Springer-Verlag, p. 71-117.
- Royden, L.H., and Horváth, F. eds., 1988, The Pannonian Basin–A study in basin evolution: American Association of Petroleum Geologists Memoir 45, 394 p.



## Transcarpathian Basin Assessment Unit - 40480401

### EXPLANATION

- Hydrography
- Shoreline
- 4048 — Geologic province code and boundary
- - - Country boundary
- Gas field centerpoint
- Oil field centerpoint
- 40480401 — Assessment unit code and boundary

Projection: Robinson. Central meridian: 0

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

Date:..... 6/1/99  
 Assessment Geologist:..... G.L. Dolton  
 Region:..... Europe Number: 4  
 Province:..... Pannonian Basin Number: 4048  
 Priority or Boutique..... Priority  
 Total Petroleum System:..... Transcarpathian Neogene Number: 404804  
 Assessment Unit:..... Transcarpathian Basin Number: 40480401  
 \* Notes from Assessor Lower 48 growth factor.

**CHARACTERISTICS OF ASSESSMENT UNIT**

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

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: 0 Gas: 5  
 Established (>13 fields) Frontier (1-13 fields) X 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 73.3 2nd 3rd 58 3rd 3rd

**Assessment-Unit Probabilities:**

Attribute	Probability of occurrence (0-1.0)
1. <b>CHARGE:</b> Adequate petroleum charge for an undiscovered field ≥ minimum size.....	1.0
2. <b>ROCKS:</b> Adequate reservoirs, traps, and seals for an undiscovered field ≥ minimum size.....	1.0
3. <b>TIMING OF GEOLOGIC EVENTS:</b> 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) median no. max no.  
 Gas fields:.....min. no. (>0) 1 median no. 4 max no. 10

**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 6 median size 20 max. size 200

**AVERAGE RATIOS FOR UNDISCOVERED FIELDS, TO ASSESS COPRODUCTS**

(uncertainty of fixed but unknown values)

<u>Oil Fields:</u>	minimum	median	maximum
Gas/oil ratio (cfg/bo).....	_____	_____	_____
NGL/gas ratio (bnl/mmcf).....	_____	_____	_____
<u>Gas fields:</u>	minimum	median	maximum
Liquids/gas ratio (bnl/mmcf).....	10	20	30
Oil/gas ratio (bo/mmcf).....	_____	_____	_____

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**SELECTED ANCILLARY DATA FOR UNDISCOVERED FIELDS**

(variations in the properties of undiscovered fields)

<u>Oil Fields:</u>	minimum	median	maximum
API gravity (degrees).....	_____	_____	_____
Sulfur content of oil (%).....	_____	_____	_____
Drilling Depth (m) .....	_____	_____	_____
Depth (m) of water (if applicable).....	_____	_____	_____
<u>Gas Fields:</u>	minimum	median	maximum
Inert gas content (%).....	2	3	4
CO <sub>2</sub> content (%).....	1	2	3
Hydrogen-sulfide content (%).....	_____	_____	_____
Drilling Depth (m).....	800	1600	4000
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)

1. Slovakia represents 52 areal % of the total assessment unit

<u>Oil in Oil Fields:</u>	minimum	median	maximum
Richness factor (unitless multiplier):.....	_____	_____	_____
Volume % in parcel (areal % x richness factor):...	_____	_____	_____
Portion of volume % that is offshore (0-100%):.....	_____	_____	_____
<u>Gas in Gas Fields:</u>	minimum	median	maximum
Richness factor (unitless multiplier):.....	_____	_____	_____
Volume % in parcel (areal % x richness factor):...	_____	90	_____
Portion of volume % that is offshore (0-100%):.....	_____	0	_____

2. Ukraine represents 40 areal % of the total assessment unit

<u>Oil in Oil Fields:</u>	minimum	median	maximum
Richness factor (unitless multiplier):.....	_____	_____	_____
Volume % in parcel (areal % x richness factor):...	_____	_____	_____
Portion of volume % that is offshore (0-100%):.....	_____	_____	_____
<u>Gas in Gas Fields:</u>	minimum	median	maximum
Richness factor (unitless multiplier):.....	_____	_____	_____
Volume % in parcel (areal % x richness factor):...	_____	10	_____
Portion of volume % that is offshore (0-100%):.....	_____	0	_____

3. Hungary represents 8 areal % of the total assessment unit

<u>Oil in Oil Fields:</u>	minimum	median	maximum
Richness factor (unitless multiplier):.....	_____	_____	_____
Volume % in parcel (areal % x richness factor):...	_____	_____	_____
Portion of volume % that is offshore (0-100%):.....	_____	_____	_____
<u>Gas in Gas Fields:</u>	minimum	median	maximum
Richness factor (unitless multiplier):.....	_____	_____	_____
Volume % in parcel (areal % x richness factor):...	_____	0	_____
Portion of volume % that is offshore (0-100%):.....	_____	0	_____

# Transcarpathian Basin, AU 40480401 Undiscovered Field-Size Distribution

