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BAZHENOVO OIL SOURCE FORMATION

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The Bazhenovo Formation of the West Siberian plate is of Volgian-Early Berriasian age and occupies an area of more than one million km^2. The formation of this sequence is related to the marine transgression, ranked as the largest during the Jurassic history of West Siberia. The area of marine sedimentation in the West Siberian megabasin sharply increased in the second half of the Kimmeridgian and occupied the most part of the basin at the beginning of the Volgian age.

The carbonate-siliceous-clayey deposits of the formation are 20-40 m thick and represent the largest hydrocarbon-generating complex of the West Siberian province.

The sketch map of the modern concentrations of organic carbon in the rocks of the Bazhenovo Formation and its age equivalents is shown in Figure 1.

The organic matter of the formation is represented by amorphous planktonic and bacterial matter, colloalginite. The average content of TOC in rock accounts for 5-12%. The hydrogen content in elemental kerogen composition is 7-8.5%. The polymer-lipid composition of kerogen is confirmed by lighter carbon isotope composition $\delta^{13}C$, -28-35‰.

The composition of bitumens, the content of which accounts for 0.3-0.5%, is specific. The bitumens of rocks, which occur in the oil window, contain 45-65% hydrocarbons, 20-40% resins, and 10-20% asphaltenes. The bitumens are characterized by higher concentrations of sulfur (to 3-5%) and vanadyl porphyrins (2-3%), low values of C_{19}/C_{23} tricyclic terpane ratio, C_{24} tetracyclic terpane to C_{23} tricyclic terpane ratio, as well as high concentrations of cholestanes (30-35% of total C_{27}-C_{29} steranes) and low concentrations of ethylcholestanes.

The favorable facies conditions of sedimentation contributed to that the OM of the Bazhenovo Formarion initially possesses high oil-generative potential. The hydrogen index of OM in rocks with low degree of catagenesis is 400-500 mg HC/gTOC, and its value decreases to 100-200 mg HC/g TOC with increasing the degree of catagenesis to grade MC_3.

Analysis of distribution of oil types in West Siberia has shown that more than 80% of the whole initial potential resources are related to the Bazhenovo Formation (oils of C_1 and C_2 genetic types).

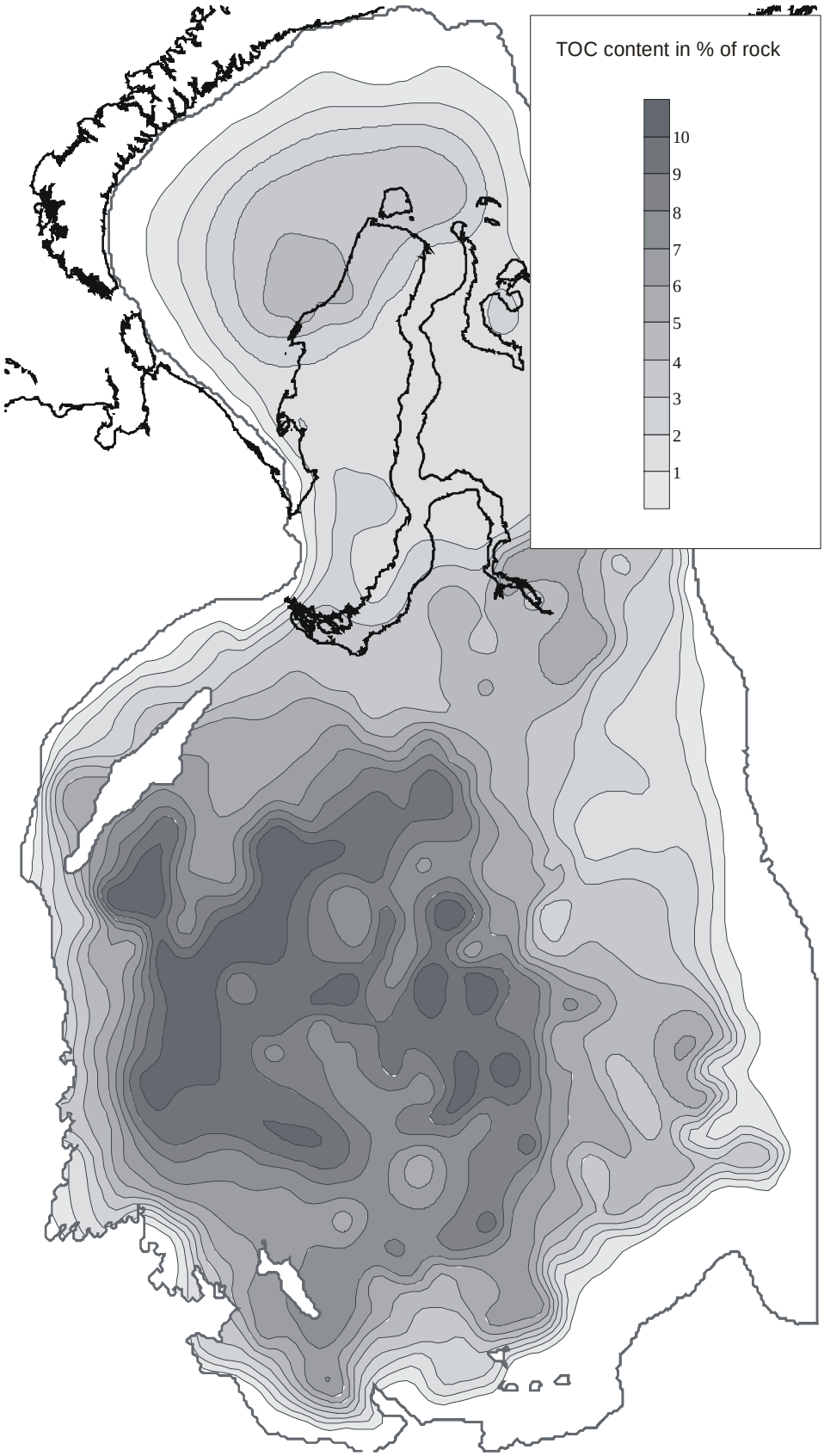

Figure 1. Sketch map of organic carbon content in the Bazhenovo Formation and its equivalents.