

PETROLEUM GEOLOGY OF EASTERN SIBERIA

CONTENTS

EXECUTIVE SUMMARY

PART I: GEOLOGY OF EASTERN SIBERIA

Chapter 1. Introduction and Overview of Eastern Siberia

- I.1.1 Description of the report
- I.1.2 Brief description of the Geography of Eastern Siberia
- I.1.3 Introduction to the Previous Exploration History and Petroleum Geology of Eastern Siberia

Chapter 2. Tectonic Evolution of Eastern Siberia

- I.2.1 The Yenisei Ridge and Pre-Sayan Region
- I.2.2 Taimyr to Verkhoyan
 - I.2.2.1 The Taimyr Zone
 - I.2.2.2 The Verkhoyan Belt
- I.2.3 The Mongol-Okhotsk Belt and Contiguous Zones
- I.2.4 Tectonic Evolution and Structural Development of the Interior of the Siberian Platform

Chapter 3. Geological Development of Eastern Siberia: Palaeogeography and Stratigraphy

- I.3.1 Riphean
 - I.3.1.1 Uchur-Maya Region
 - I.3.1.2 Pre-Patom Region
 - I.3.1.3 Angara-Lena Region
 - I.3.1.4 Pre-Sayan Region
 - I.3.1.5 Baikit Antecline

- I.3.1.6 Chadobets Uplift
- I.3.1.7 Katanga Saddle
- I.3.1.8 Pre-Yenisei Region
- I.3.1.9 Turukhansk Uplift
- I.3.1.10 Anabar Arch

- I.3.2 Vendian (to Early Cambrian)
 - I.3.2.1 Vilyuchan Horizon
 - I.3.2.2 Nepa Horizon
 - I.3.2.3 Tira Horizon
 - I.3.2.4 Danilovo Horizon

- I.3.3 Cambrian to Early Devonian

- I.3.4 Middle Devonian to Tournaisian

- I.3.5 Viséan to end-Permian

- I.3.6 Early Triassic

- I.3.7 Middle and Late Triassic

- I.3.8 Jurassic and Cretaceous

- I.3.9 Cenozoic

**PART II: **PETROLEUM GEOLOGY AND HYDROCARBON PROSPECTIVITY
OF SIBERIA****

Chapter 1. Overview of the Petroleum Geology of Eastern Siberia

- II.1.1 Reservoirs and Seals
 - II.1.1.1 Riphean
 - II.1.1.2 Vendian (to Lower Cambrian)
 - II.1.1.3 Cambrian
 - II.1.1.4 Ordovician to Devonian
 - II.1.1.5 Devonian
 - II.1.1.6 Carboniferous to Permian

- II.1.2 Source Rocks, Hydrocarbon Generation and Migration
 - II.1.2.1 Riphean source rocks and source kitchens
 - Anabar kitchen*
 - Turukhansk kitchen*
 - Yenisei-Baikit kitchen*
 - Baikal-Patom kitchen*
 - Kureika Syncline kitchen*
 - II.1.2.2 Cambrian source rocks
 - II.1.2.3 Silurian and Devonian source rocks
 - II.1.2.4 Late Palaeozoic source rocks
 - II.1.2.5 Jurassic source rocks

Chapter 2. Hydrocarbon-Bearing and Prospective Regions of Eastern Siberia

- II.2.1 Known Hydrocarbon-Bearing Regions
 - II.2.1.1 Angara-Lena
 - II.2.1.2 Nepa-Botuoba
 - II.2.1.3 Baikit
 - II.2.1.4 Katanga Saddle
 - II.2.1.5 South Tunguska Basin
 - II.2.1.6 Vilyui Syncline and Pre-Verkhoyan Region
 - Vilyui Syncline*
 - Pre-Verkhoyan marginal trough*
 - II.2.1.7 Anabar Arch
- II.2.2 Other Areas of Eastern Siberia
 - II.2.2.1 Kureika (North Tunguska) Syncline
 - II.2.2.2 Pre-Sayan—Yenisei Syncline
 - II.2.2.3 Pre-Patom (= Pre-Baikal—Vilyui Trough)
 - II.2.2.4 Turukhansk-Noril'sk Zone
 - II.2.2.5 Aldan Arch

Chapter 3. Heavy Oil and Bitumen Deposits of Eastern Siberia

- II.3.1 Definition and Classification of Heavy Oils and Bitumens
- II.3.2 Heavy Oil and Bitumen Deposits in Eastern Siberia
 - II.3.2.1 The Olenek bitumen deposit
 - II.3.2.2 Other bitumen deposits of Eastern Siberia
 - (1) *Central Olenek*

Contents.4

- (2) *East Anabar*
- (3) *Chekurovka*
- (4) *Siligir-Markha*
- (5) *Rassokha*
- (6) *Chunya*
- (7) *Medvezh'ye*
- (8) *Turukhan*
- (9) *Bulkur*
- (10) *Tuolba*
- (11) *Amga (Bologur)*
- (12) *Sina*
- (13) *Ust'-Lena*
- (14) *Kuoyka*
- (15) *Sololisk*
- (16) *Chenkiyam/Ilygir*
- (17) *Tunguska*
- (18) *Kelimyar*
- (19) *Southwest Angara-Lena*
- (20) *Muna*

II.3.3 Production of Heavy Oils and Bitumens

II.3.4 Summary of East Siberian Bitumen Deposits

BIBLIOGRAPHY

ENCLOSURES [Listed below]

LIST OF FIGURES

- Figure I.2.1** Cartoon palaeotectonic reconstruction for end-Cambrian
- Figure I.2.2** Cartoon palaeotectonic reconstruction for Late Carboniferous—Early Permian
- Figure I.2.3** Cartoon palaeotectonic reconstruction for Late Jurassic—Early Cretaceous
- Figure I.2.4** Tectonic sketch map of the fold-and-thrust belts on the margins of the Siberian Platform

- Figure I.3.1** Stratigraphic terminology and correlation of some key Vendian and Cambrian horizons of Eastern Siberia, and their relationship with named hydrocarbon-bearing zones and horizons.
- Figure I.3.2** Palaeogeographic maps showing the southern Siberian Platform during the Vendian.
- Figure II.3.1** Summary of nomenclature and properties of heavy oils and bitumens commonly used in Russia.
- Figure II.3.2** Map showing the outcropping lithology and nature of bituminous deposits in the Olenek and Bur river region.
- Figure II.3.3** Stratigraphic correlation of cored well sections in the Olenek bitumen deposit.
- Figure II.3.4** Schematic cross section across the Olenek uplift and Bulkur anticline.

Additional figures illustrating individual oil and gas fields are included within Volume II (Field Database).

- Table II.1.1** Summary of the main potential source rocks identified within kitchen areas on and around the Siberian Platform.

LIST OF ENCLOSURES

- ENCLOSURE 1:** GENERAL LOCATION MAP OF THE SIBERIAN PLATFORM SHOWING MAJOR GEOGRAPHIC FEATURES AND EXTENT OF EASTERN SIBERIAN HYDROCARBON REGIONS
- ENCLOSURE 2:** MAP OF NAMED HYDROCARBON-BEARING AND PROSPECTIVE REGIONS AND THE DISTRIBUTION OF CONVENTIONAL HYDROCARBON FIELDS IN THE EASTERN SIBERIA REGION
- ENCLOSURE 3:** MAP SHOWING MAJOR STRUCTURAL COMPONENTS AND BASEMENT CONFIGURATION OF THE EASTERN SIBERIAN HYDROCARBON PROVINCE
- ENCLOSURE 4:** REPRESENTATIVE CROSS SECTIONS THROUGH THE SIBERIAN PLATFORM

- ENCLOSURE 5:** MAP SHOWING DISTRIBUTION AND THICKNESS OF RIPHEAN SEDIMENTS ON THE SIBERIAN PLATFORM
- ENCLOSURE 6:** REPRESENTATIVE STRATIGRAPHIC COLUMNS OF THE RIPHEAN IN DIFFERENT PARTS OF THE SIBERIAN PLATFORM
- ENCLOSURE 7:** PALAEOGEOGRAPHIC MAP OF THE LOWER (LENA STAGE) TO MIDDLE (AMGA STAGE) CAMBRIAN, INDICATING THE LITHOLOGIES DEPOSITED
- ENCLOSURE 8:** PALAEOGEOGRAPHIC MAP OF THE MIDDLE (MAY STAGE) TO UPPER CAMBRIAN, INDICATING THE LITHOLOGIES DEPOSITED
- ENCLOSURE 9:** PALAEOGEOGRAPHIC MAP OF THE EASTERN SIBERIA HYDROCARBON PROVINCE IN THE MIDDLE TO LATE DEVONIAN
- ENCLOSURE 10:** PALAEOGEOGRAPHIC MAP OF THE EASTERN SIBERIA HYDROCARBON PROVINCE IN THE LATE CARBONIFEROUS TO EARLY PERMIAN
- ENCLOSURE 11:** PALAEOGEOGRAPHIC MAP OF THE EASTERN SIBERIA HYDROCARBON PROVINCE IN THE LATE TRIASSIC
- ENCLOSURE 12:** PALAEOGEOGRAPHIC MAP OF THE EASTERN SIBERIA HYDROCARBON PROVINCE IN THE NEOCOMIAN
- ENCLOSURE 13:** MAP ILLUSTRATING THE ESTIMATED EXTENT AND RESERVES OF BITUMINOUS DEPOSITS IN THE EAST SIBERIAN HYDROCARBON PROVINCE

VOLUME II: OIL AND GAS FIELD DATABASE OF EASTERN SIBERIA

(Extracted from Blackbourn Geoconsulting's FSU Oil & Gas Field Database)