

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Assessment of conventionally recoverable petroleum resources of the
West Siberian basin and Kara Sea basin, U.S.S.R.

by

Charles D. Masters

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This report is preliminary and has not been reviewed for conformity
with U.S. Geological Survey editorial standards and stratigraphic
nomenclature.

1981

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PREFACE


The following preliminary report is a product of the World Energy Resources Program of the U.S. Geological Survey (USGS). The program is designed to prepare geologically based resource assessments of the potential petroleum basins of the world. Initial investigations of the program focus on the major petroleum-producing regions of the world with the objective of acquiring a critical unbiased perspective on the resource potential of a field, a basin, and ultimately a country as a whole. In selected areas, follow-on studies to analyze production potential are conducted by U.S. Department of Energy (DOE) petroleum engineers, and the combined results are incorporated in a report for the Foreign Energy Supply Assessment Program (FESAP) of the DOE and the USGS. This USGS Open-File Report includes only the preliminary assessment and some minimal backup data and comments relevant to the assessment.

INTRODUCTION

The locations of the West Siberian basin and Kara Sea basin are shown in figure 1. Unconditional estimates by the USGS of oil and gas resources in these basins are given in table 1 and figures 2 and 3. Data supporting these estimates are supplied in table 2.

ACKNOWLEDGEMENT


The resource assessment for this report was prepared under the guidance of the Resource Appraisal Group of the Branch of Oil and Gas Resources. The geologic investigation leading to the assessment was conducted by H. Douglas Klemme, who was on contract to the U.S. Geological Survey.


Assessment region 

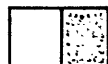
Area in mi² 2,100,000

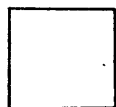
Vol. of sed.
in mi³ 1,580,000

Explanation

 Areas containing known oil or gas deposits or which are favorable for their occurrence

 Subbasin associated with large depocenter

 Unlabeled and stippled areas judged to be nonprospective for hydrocarbons

 Scale--25,000 square miles (65,000 square kilometers)

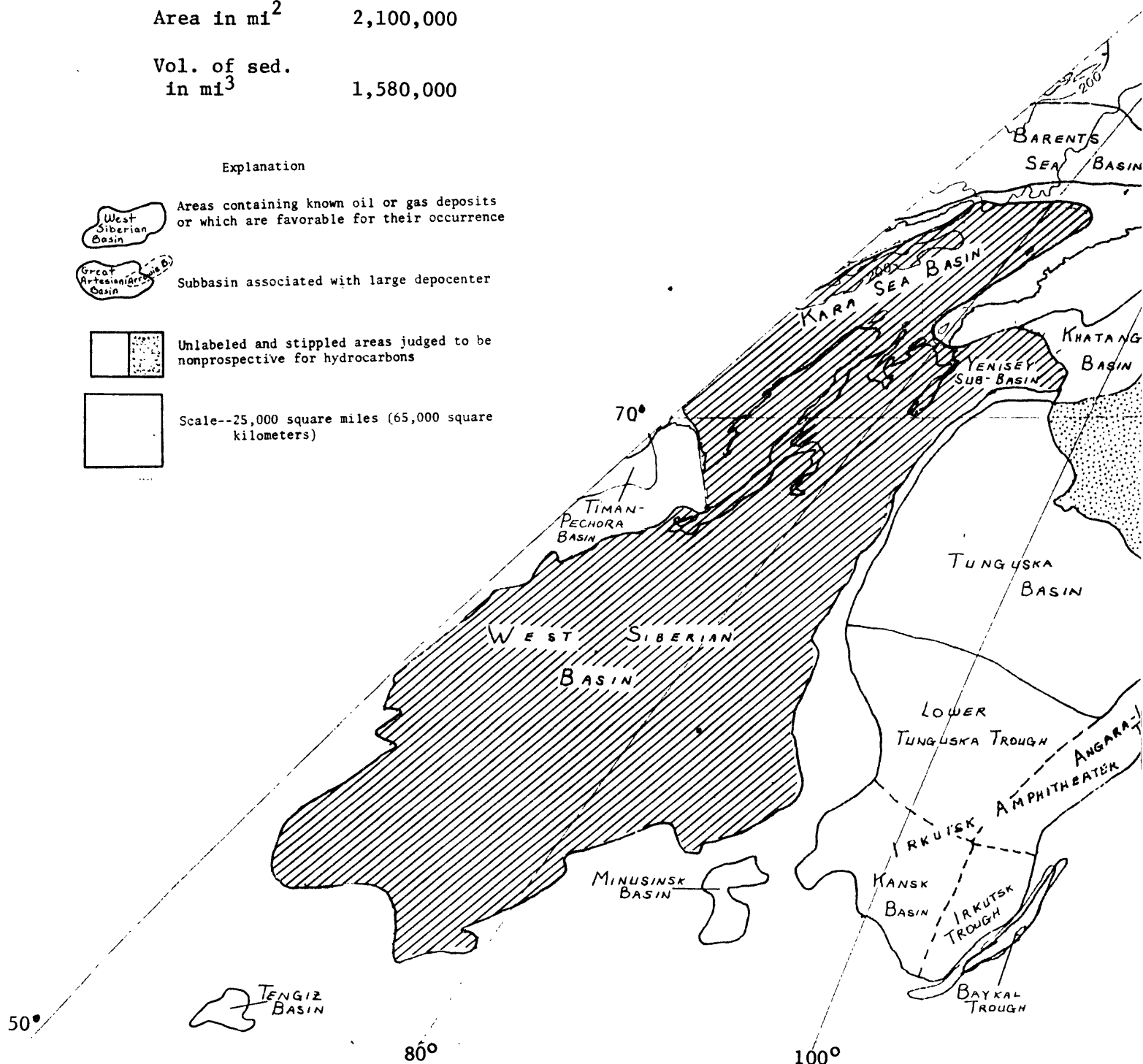


Figure 1.--Location map of West Siberian basin and Kara Sea basin assessments.

Modified from: Map of Prospective Hydrocarbon Provinces of the World, 1978, U.S. Geological Survey Miscellaneous Field Studies Map MF-1044-C.

Table 1.--Assessment of conventionally recoverable petroleum resources of the West Siberian basin and Kara Sea basin, U.S.S.R.

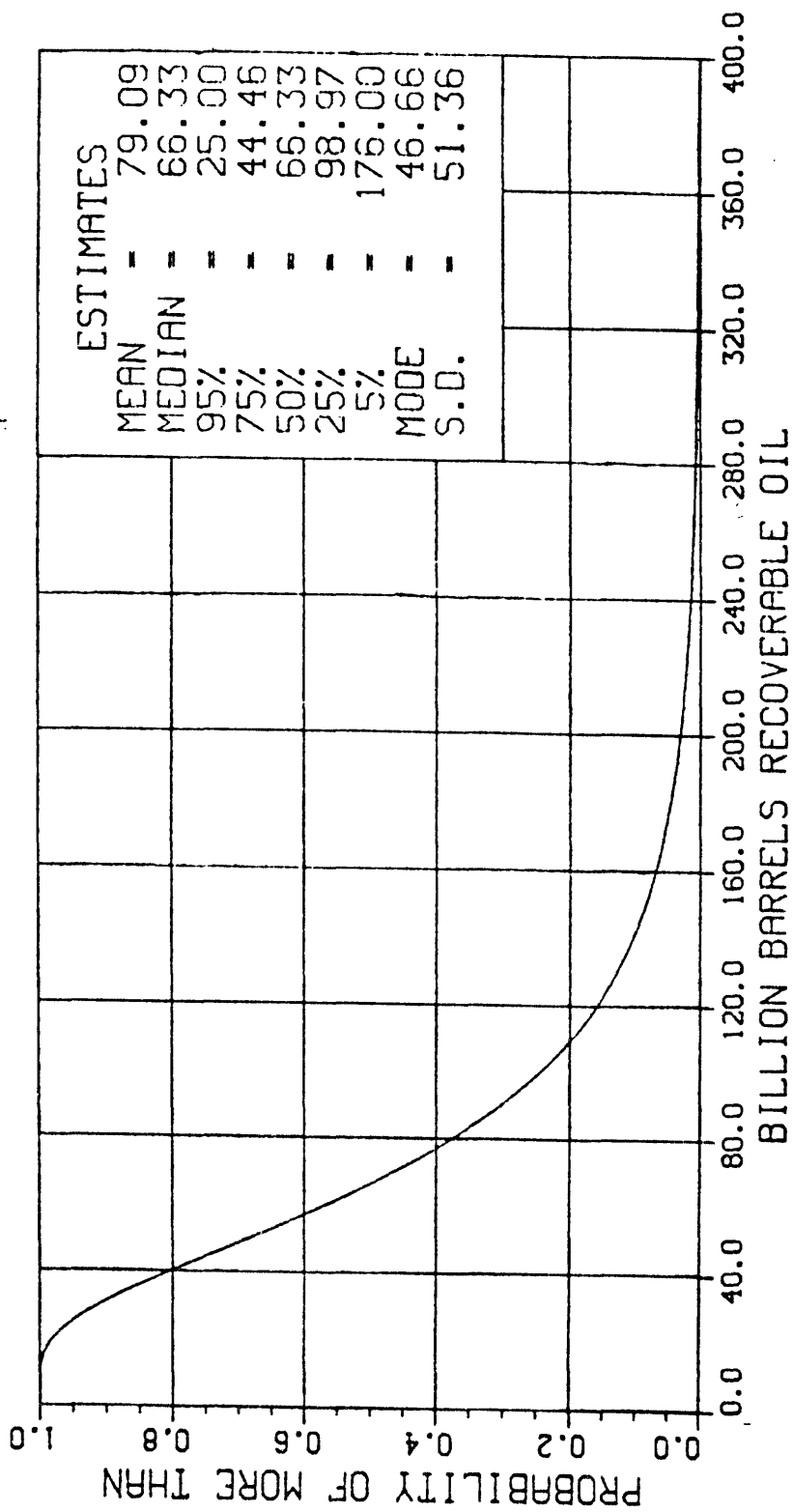
Unconditional resource assessment by USGS as of 4/3/81; see also figures 2, 3.

Probability of occurrence in %	Crude Oil in Billions of Barrels (BB)			Natural Gas in Trillions of Cubic Feet (Tcf) and Billions of Barrels of Oil Equiv- alent (BBOE) @ 6,000 cuft/bbl.		
	<u>95%</u>	<u>5%</u>	<u>Mean</u>	<u>95%</u>	<u>5%</u>	<u>Mean</u>
Estimate	25	176	79	235	1,519	702
				BBOE 39	253	117

UNCOND

Assessment date: 4/3/81

Figure 2.--West Siberian and Kara Sea basins recoverable oil



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Assessment date: 4/3/81

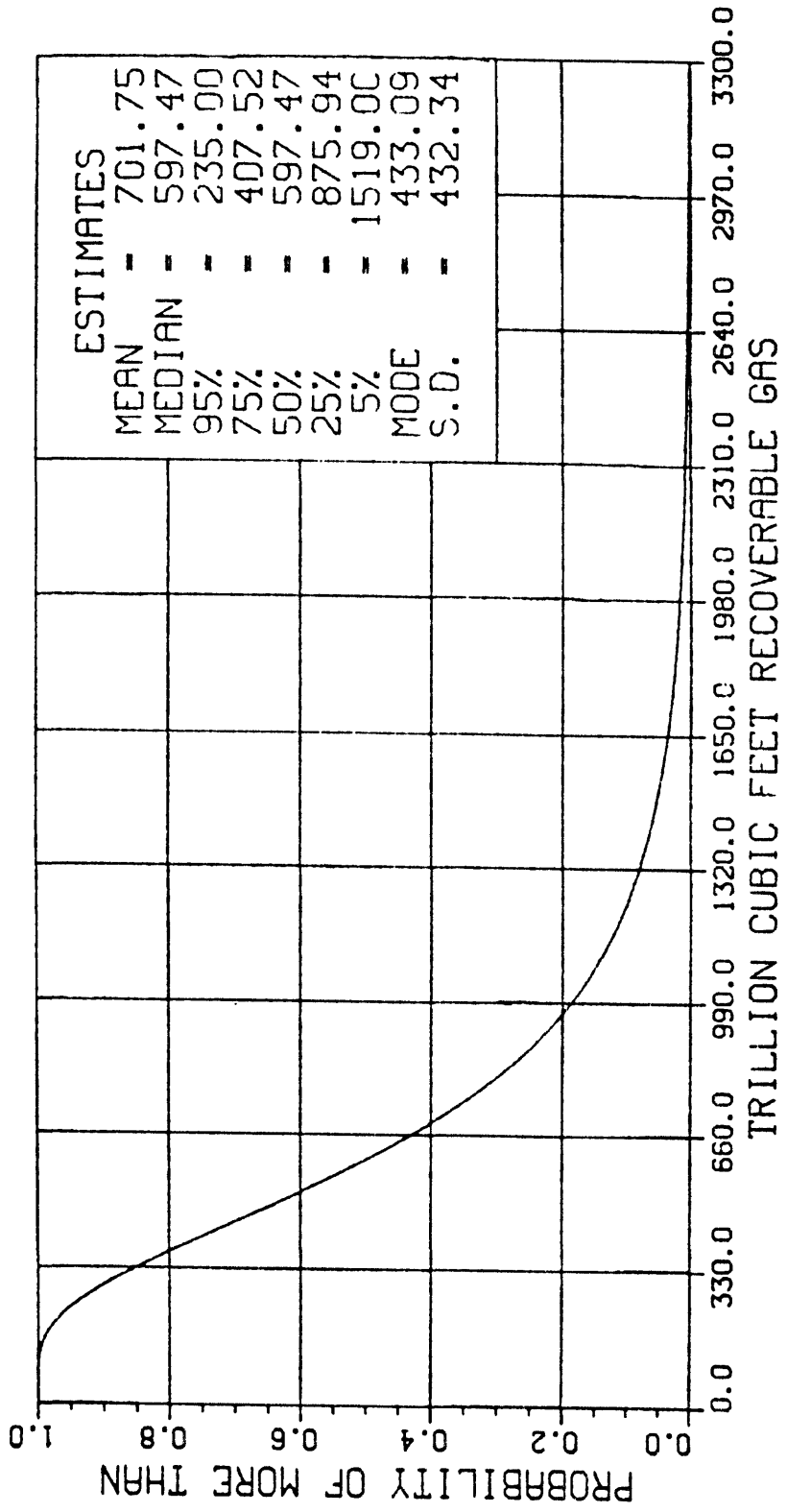


Table 2.--Supplementary and comparative data supporting this resource assessment of the West Siberian and Kara Sea basins, U.S.S.R.^{1/}

Crude Oil (BB)		Natural Gas (Tcf)	
1. Cumulative production to 1/1/80		Cumulative production to 1/1/80	
9.8		+ <u>2/</u>	
2. Identified reserves ^{3/}		Identified reserves	
Demonstrated	35	Demonstrated	400
Inferred	<u>30</u>	Inferred	<u>260</u>
	65		660
		BBOE	110
3. Original recoverable resources (ultimate) of West Siberian Basin and Kara Sea basin			
Cumulative	10	+ <u>2/</u>	
Identified reserves	65	660 <u>4/</u>	
Undiscovered			
resources (mean)	<u>79</u>	<u>702</u>	
	154	1,362+	
		BBOE	227+
Total = 381+ BBOE			

^{1/} Cumulative production and reserves are composited estimates from various sources.

^{2/} Quantity positive but data unavailable.

^{3/} Follows terminology outlined in USGS Circular 831. Demonstrated is equivalent to API Proved and Indicated Additional. Inferred represents anticipated field growth in existing fields.

^{4/} Includes 60 BBOE of biogenic gas.

COMMENTS

- o Assessment does not include gas hydrates or possible resources from the Bazhenov Formation that might be recovered by nuclear methods.
- o Assessment does include general Kara Sea region under the assumption that recovery is possible in spite of extreme ice conditions.
- o Reserve numbers assume that the reported variance in the size of fields reflects to some major degree definitional differences; hence, the high numbers were interpreted to include inferred reserves, and the low numbers were used for demonstrated reserves.
- o Major structural features presumably have been explored, but clearly dry-hole data available to us are sparse.
- o Some giant oil fields are still possible in the central and southern areas of the assessment region, owing both to growth of existing fields and to new discoveries.
- o We anticipate that most oil will be derived from Jurassic and Lower to Middle Cretaceous units.
- o Deep oil has not been well explored in the northern region, but there are problems of limited source-rock.
- o Upper Paleozoic units are prospective but are not expected to be significant, in part owing to erratic distribution.
- o Gas will be concentrated in the northern region of the assessment area because of presence of permafrost seal.
- o We assume that depth of permafrost will be considerably less in the Kara Sea area than in the adjoining onshore area.