Republic of Yemen

Sana'a University
Faculty of Petroleum and Natural Resources

الجمهورية اليمنية

جــامعة صنعـاء
كليـــة البترول والموارد الطبيعية

<u>**A report on the discussion of the master's thesis submitted by the**</u>
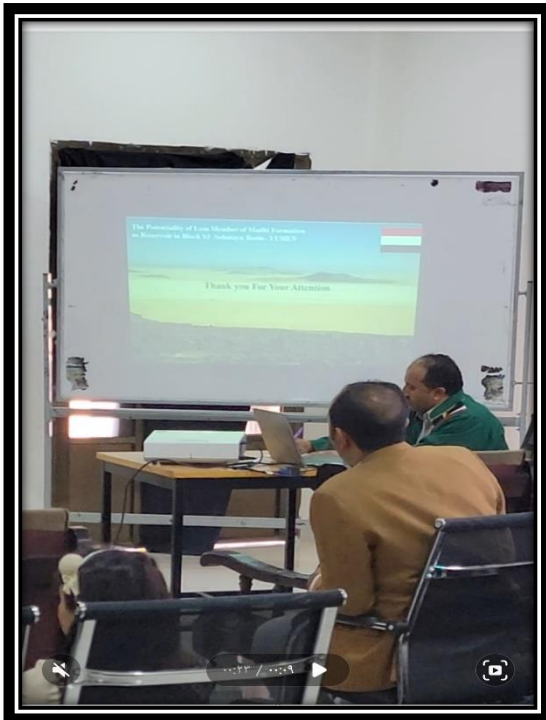
<u>**researcher Ali Saleh Nagi Ghurab**</u>

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On Saturday, December 23, 2023, a public discussion was held at the Faculty of Petroleum and Natural Resources of the master's thesis submitted to the Department of Earth Sciences by the student Ali Naji Saleh Ghorab, entitled "**The potentiality of the LAM Member of the Madbi Formation as a Reservoir and Producer of Hydrocarbons in Block S2, Sabatayn Basin, Yemen**", under the supervision of Dr. Adel Al-Matary. The discussion committee was composed of:

1. Prof. Dr. Bassim Shaif Al-Khirbash, Sana'a University, Chairman - Internal examiner
2. Professor Adel Mohammad Al-Matary, Sana'a University, Supervisor, member
3. Prof. Dr. Muhammad Hail Al-Hakimi, University of Taiz, external examiner - member

During which the student reviewed the most prominent results included in his study, and highlighted the evaluation of the Lam Member as an unconventional oil reservoir in this Block through studying oil shows, the results of well tests and well logging for a number of wells drilled in this Block and also from studying the core samples taken from the studied wells. Abstract attached.

Abstract

Block S2 (Al Uqlah) study area is located on the northern part of the Sab'atayn Basin in the province of Shabwah. Many wells have successfully tested oil from the fractured Basement and Kuhlan formation on tilted fault blocks which form the Central Basement High in the Sab'atayn Basin. The Habban field is produced primarily from fractured crystalline Basement horsts, and the overlying thin, heterogeneous sandstone of the pre-rift Kuhlan Formation. The primary reservoir is the low to medium-grade metamorphic Precambrian Basement and the upper part of Madbi Formation (Lam member) reservoir is a secondary shallow target in the Block S2 Habban Field. This study aims to evaluate the hydrocarbon reservoir within the lam member which is the upper Madbi Formation of the Upper Jurassic Age in the Habban field of Block S2 Sab'atayn Basin. This study is mainly based on well-logging data from some boreholes, mud-logging data, well-site geologist observations, and core analysis which were processed, analyzed, interpreted, and evaluated. During the well log correlation stage, it was found that the Lam reservoir consists vertically of three zones ordered from the top downwards with two possible reservoir zones. The reservoir zones are in the upper and lower sections with a non-reservoir section in between them. The lower Lam is more thickest and most lateral continuing sands, whilst reservoir sands in the upper Lam are less thickness with best oil shows than lower Lam, both vertically as well as horizontally. Lower Lam shows poorer petrophysical properties and the Upper Lam shows better oil shows with good petrophysical properties with a very low porosity due to extensive carbonate cementation. The Lam Member consists of fine-grained, calcareously cemented sandstones interbedded with more dominant claystone and limestone. The Lam member is of Low reservoir quality and is a critical risk and is related to its tightness and the significant cementation of pore space by calcite, Ankerite, and sometimes Dolomite. Lam sediment porosities range from 8 to 21% and Permeabilities range from 0.10 to 10mD. The best potential reservoir is with a 12.00 m average Net Pay and SW

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