



Marine Geophysical Study to Explore the Seafloor Bathymetry and Geological Features at the Iraqi Corridors, Northwestern Arabian Gulf

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Abstract—The study area is located at the Iraqi coastal side, north of the Arabian Gulf (where the Al-Faw Grand Port is constructed). Marine geophysical surveys using a multi-beam echosounder, sub-bottom profiler, and side-scan sonar were conducted. The objectives were to map the bathymetry of the seafloor and the nature and thickness of the underlying layers of the bottom to 40-m depth and validate the port for sea navigation and reception of ships. The side-scan sonar data identified wrecks related to vessels or scouring caused by fishing activities. In this technique, four profiles (P1, P2, P3, and P4) were surveyed using a sub-bottom profiler to obtain additional detailed information about the area between these profiles with the assistance of borehole data, which was used for drilling in Khor Abdullah. Two types of anomalies (features) were identified in these clips (profiles). The first anomaly can be explained as an ancient river course buried under the sediments of the bottom during transgression and regression periods composed of marine sediments and remains of organisms. The first anomaly identified in these profiles of sub-bottom data represents the subsidence that occurred on the eastern breakwater. The closest interpretation is the exits of an old channel. The second feature observed in P4 (extends from 1.5 to 2 km) may be caused by Early Cambrian intruded salt diapirs.

Keywords: Al-Faw, bottom, sonar, echosounder, seafloor, morphology.

Abbreviations

AG	Arabian Gulf
FGP	Al-Faw Grand Port
MBES	Multi-beam echosounder
SBP	Sub-bottom profile
SSS	Side-scan sonar

SBT	Standard penetration test
CPT	Cone penetration test

1. Introduction

Iraq, Iran, Kuwait, Saudi Arabia, Bahrain, Qatar, and UAE have important strategic coastal locations and geo-economics. Thus, studying their geomorphological and tectonic systems and coasts overlooking the Arabian Gulf (AG) is important. Only a part of the Gulf coast has permanent water inlets from the Shatt Al-Arab River, flat delta of Shatt Al-Arab, sub-tidal flats, subaqueous gullies, subaqueous distributaries, Khors, or lagoons inland. These gulf countries account for more than 65% of the annual international oil trade, mostly relying on the marine coasts, and oil is transported through ports and shipping overseas. Moreover, the Iraqi coast is approximately 64 km long. Despite its small size compared with Kuwait and Iran with coastlines of 500 and 2000 km, respectively, its coast is still an important coastline for shipping and trading purposes for Iraq. Thus, the Al-Faw Grand Port (FGP) has gained motivation for development. The advantage of this port is very important to Iraq because it is the largest in the region. This port is planned to contain 99 berths for berthing and launching of ships, in addition to an oil refinery and other berths for the export of crude oil and oil derivatives, with an integrated industrial city, such as petrochemical plants and others. However, we faced difficulties from the government and companies to carry out marine surveys in the area. The importance of the geographical location of Iraq in general, and Basra in particular,

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