# Seismic Stratigraphy Interpretation and Petroleum Exploration at the Scarab field, Offshore, Nile Delta, Egypt

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**Abstract**— *The Scarab field, situated in the Nile Delta concession of western Delta, has estimated that reservations of high-quality gas are greater than four trillion cubic feet. 2D Seismic dataset supported by composite logs enable the interpreter to generate a detailed view of the output results. Detection of the reservoir zone can be enhanced by analysing wells log data based on Gamma-ray, Resistivity, and Vp sonic logs respectively. Composite logs of Scarab-Da, Scarab-Db, and Scarab-Dc wells indicate the lateral and vertical variation of the gas reservoir in El Wastani Formation. However, for enhancement the detection of the hydrocarbon reservoirs, it is important to carefully analyze the well log dataset of the three wells as well as the available 2D seismic dataset. Based on the lithofacies distribution of the studied formation. The effective porosity and the hydrocarbon saturation increase in El Wastani Formation. In all wells, the average shale content is 0.35 %, the effective porosity is 0.20%, the water saturation is 0.25%, and the net pay range is 25 to 50 m. It is obvious that the facies effect is the main factor that is controlling the distribution of the petrophysical properties, within all wells.*

**Keywords**— *Seismic Stratigraphy, Offshore Nile Delta, Gas bearing sand zones, Well logging, Scarab field.*

## I. INTRODUCTION

The Nile Delta occupies the north-eastern part of the African continent and it is representing one of the world’s classic deltas. The present-day delta has passed through different events as part of the regional tectonics in the Mediterranean area which has shaped many of its physiographic features. This area is now regarded as a major gas province and promising area for future petroleum exploration.

The West Delta Deep Marine (WDDM) concession lays 50-100km offshore Egypt and covers 6150km² of the North West margin of the Nile cone. Fields in this area provide two-thirds of the gas production in Egypt. Geological knowledge of the Nile delta is still limited because of insufficient subsurface data. Gas is generated and accumulates at stratigraphic levels ranging from the lower Miocene to the lower Pliocene. The initial exploration wild cat success ratio was 1:3.6, higher than the international norm (Abu El-Ella, 1990), with thirteen consecutive exploration and appraisal wells, were successfully drilled on nine separate fields. The Nile Delta offshore is rapidly emerging as a major gas province (Samuel et al., 2003). So that, it is the important productive province for gas in Egypt. The investment of international gas and oil companies in Egypt 2003 was estimated to be approximately $2 billion with natural gas being the fastest growing sector (Bermúdez-Lugo, 2003). The WDDM concession (Fig. 1) was acquired by BG Group and partners Edison Gas in 1995 and is concession in which the Scarab field is found.

The production in this area represents around two-thirds of the gas production in Egypt. Geological information of the Nile delta is still insufficient and need more exploration activities in the future because of the limited subsurface data. Gas is originated and trapped at stratigraphic traps extending from the Lower Miocene to the Lower Pliocene. Multitrillion cubic feet of new gas discoveries in the east, center and west offshore Nile Delta Basin through the last few years (Barsoum et al., 2002; Niazi and Dahi, 2004, Ismail et al., 2020a). Reilly, 2016, pointed out the difficulty of the identification of deep-water reservoirs which represents a challenge where the depositional system with more complexity and limited exploration level. The newly acquired seismic data in the WDDM concession was obtained in 1995 by both BG Group and Edison Gas.

Sand deposits associated with channels often form hydrocarbon reservoirs. For this reason, the detection of channels is a of great importance in seismic data interpretation for hydrocarbon exploration.

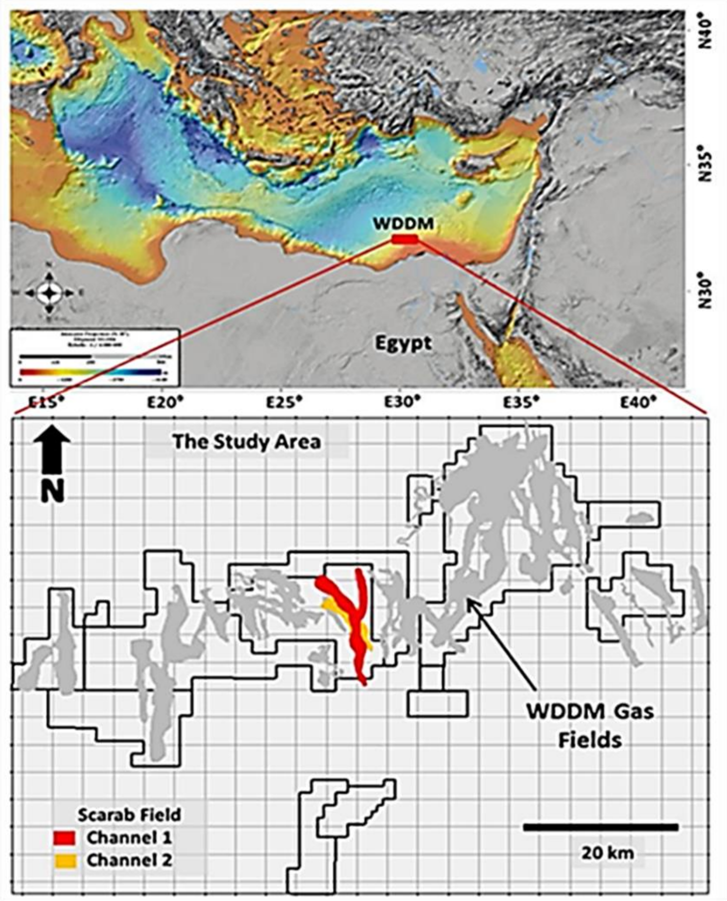


Fig.1. Bathymetric map of the eastern Mediterranean region and index map showing the location of the Scarab Field in West Delta Deep Marine concession, offshore Nile Delta, Egypt. Modified from CCGM/CMGW.

## II. **Geology of the area**

During the Jurassic till Early Cretaceous the Tethyan rift margin was transpressional inverted throughout the Syrian Arc Orogeny (Ayyad and Darwish, 1996). This Syrian arc event consisted of intermittent uplifts which culminated in the late Cretaceous to late Eocene ascribing a compressional regime.

In the northern delta area, especially in the east and west central parts, the thickness of the Early Miocene is highly influenced by a relation of block faulting and the erosion of the high parts during the Late-Middle Miocene uplift (EGPC, 1994).

The Tortonian interval was represented by a northward prograding shelf system (Bertello, 1996). This was followed by Mediterranean Sea regional regression (Messinian Salinity Crisis) with evaporites deposition in restricted basins and subsequent fluvial – estuarine deposition. Throughout the early Pliocene, the main transgression happened. Thick prograding marine sequences were deposited during the Plio-Pleistocene with the well-developed slope to basal submarine channel complexes consisting of varying reservoir quality sands in varying small and sometimes inter-connected traps.

Lateral variation is very strong amongst a relatively uniform flat, dirty sand and shale background geology. Source rocks are formed in the late Mesozoic to early Miocene sediments (Vandré et al., 2007) with Upper Cretaceous black shales containing good quality source rocks with high total organic content (Abdel Aal et al., 2000). (Fig. 2) shows the stratigraphic column of the Nile Delta and the hydrocarbon system in the area.

The structural setting of the WDDM area shows that it is a fault-bounded block with complex interplay among three main fault trends; the Southwest-Northeast trending Rosetta fault in the Southeast, large East-West faults in the Northeast with rotated fault blocks making the Northwestern boundary (Abdel Aal et al., 2000). The Rosetta fault is the largest in the region, a major SW-NE orientated extensional to strike-slip. Wells drilled in the study area (Fig. 1) did not reach to Lower Miocene, and hence the available information about the geologic history for pre-Lower Miocene depends on the previous studies which include prediction and interpretation given from the geophysical data in the form of seismic and gravity surveys about Nile Delta.

## III. **Methodology**

Identification of thin gas zones and channels using 2D post-stack seismic data analysis is very challenging in West Delta Deep Marine (WDDM). The thickness of sandstone reservoir intervals at different zones along the area is close to the resolution limit of the seismic data. In this study, the analysis was supported by different logs of three wells (Scarab-Da, Scarab-Db, and Scarab-Dc). These wells are analysed and confirmed as productive wells with a suite of wireline logs such as Vp sonic log, resistivity, and gamma-ray (Ismail et al., 2020a; Ismail et al., 2020b; Ismail et al., 2020c; Ismail et al., 2020d). Seismic data conditioning, Wavelet extraction, and synthetic seismograms are extracted (Fig.3) to have an accurate tie and pick the seabed surface (Bilqas / Mit Ghamr Formation), El Wastani Formation, top and base of Channel

1, and top and base of Channel 2, Kafr Elsheikh Formation and Abu Madi Formation. and geological structures before starting use of wireline well logs in sequence stratigraphic interpretations and classification of the Miocene-Pliocene sequence which is drilled in three wells in the Scarab gas Field, north Delta, Egypt.

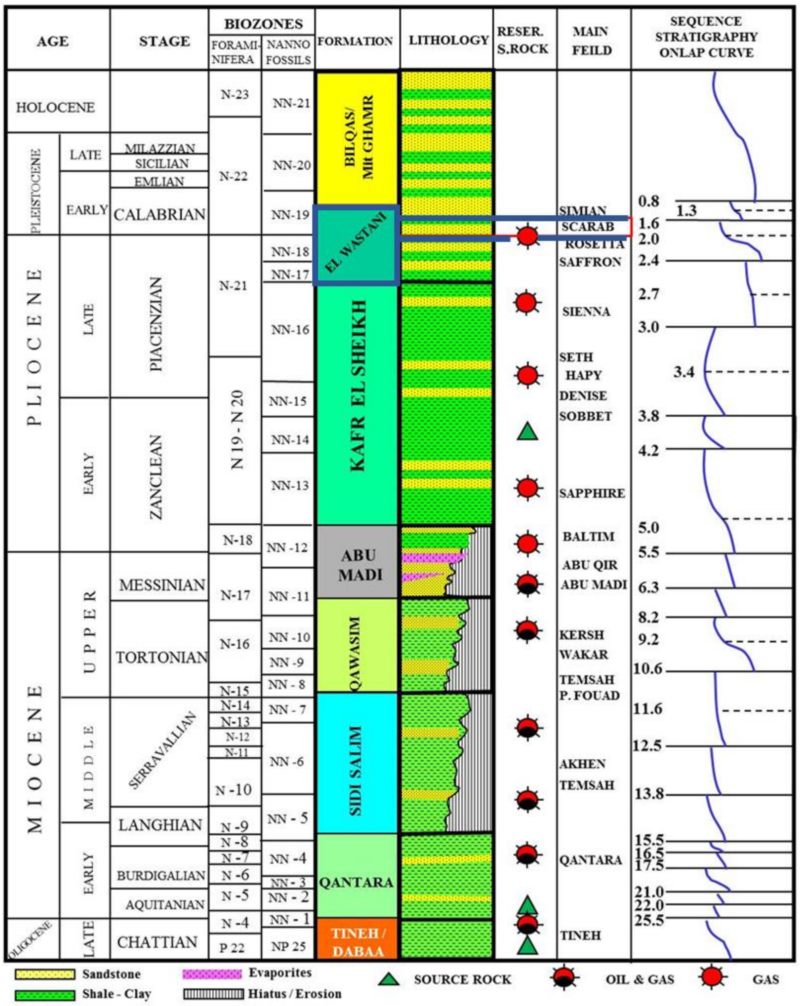


Fig. 2. Nile Delta stratigraphic column and hydrocarbon system, modified from Rio et al., 1991.

*A. Seismic to well tie*

In the first step, check-shot correction (Fig. 4) and the extraction of a statistical wavelet has been done to create synthetic seismograms using the 2D post-stack seismic data supported by all five wells. This was used to detect the correct depth to TWT of all the formation tops on seismic data. The wavelet that provides an optimum seismic to well log tie has a characteristic phase, frequency, and amplitude which are greatly important through the seismic interpretation using advance techniques like seismic attributes and seismic inversion analysis. It is common to extract the seismic wavelet using the statistical method (Nanda, 2016). This process involves the comparison between the real seismic data and well logs responses with the synthetic trace (Fig.3). Chopra and Sharma, 2016, showed if the calibration results provide a good matching through the correlation with the consideration of the fresnel zone parameter, then the seismic can be in terms of geology. If the calibration results were not accurate, Therefore, the interpretation of seismic data still with major uncertainty. The statistical wavelet extraction process uses auto-correlation and assumes a user-defined constant phase.

A zero-phase was assumed as the processing of the seismic would have implemented this by convolving the seismic data with an inverse filter that converts the estimated wavelet in the data to a zero-phase equivalent. In the current seismic polarity, the phase of the extracted wavelet has a reverse SEG polarity (Fig. 3). The extraction of a statistical wavelet is done in the time window with the reliable matching between seismic and synthetic reflectivity. A constant computation window of 600 ms (between 1700 ms to 2300 ms), 200 ms in length with a 25 ms taper. Then, as shown in figure 3, a synthetic seismogram was created using the same parameters.

*B. Seismic interpretation*

Eight horizons are structurally and stratigraphically interpreted after wells to seismic tie and checkshots correction, including seabed surface (Bilqas / Mit Ghamr Formation), El Wastani Formation, top and base of Channel 1, and top and base of Channel 2, Kafr Elsheikh Frmation and Abu Madi Formation. All horizons are smoothed and checked previously the layers between horizons are built to be consistent with the depositional sequence.

## IV. **Results and Discussion**

*A. Sequence stratigraphy of Scarab gas Field based on well logs.*

Using well logs data, two depositional sequences (sequence-1 and sequence-2) are identified in the Pliocene El Wasteni Formation in three wells of the Scarab Gas Field. The sequence stratigraphic classification of the three studied wells (Figs. 5-7).

1) *Sequence stratigraphic classification of Scarab-Da well based on wireline log data.*

2) *Sequence-1*

The lower unit in the Pliocene El Wastani Formation of the Scarab-Da gas Field consists of the upper part of the highstand systems tract based on logging data (gamma ray, resistivity, and density-neutron logs) (from depth 1680m to1740m).

3) *The Highstand Systems Tract*

The highstand systems tract is defined as the interval between maximum flooding surface at base and sequence boundary type 2 at top. It is defined by high gamma ray, low resistivity, and no separation between density-neutron, as a result of shale and small streaks of silt (from depth 1680m to1740m).

*4) Sequence-2*

The upper unit in the Pliocene El Wasteni Formation in the Scarab-Da gas Field is the sequence-2. This sequence consists of the four-fold subdivisions of the sequence; lowstand, transgressive, lowstand and highstand systems tracts from base to top. Sequence two is bounded from the base with sequence boundary one, and from the top with sequence boundary two (from depth 1600m to 1670m).

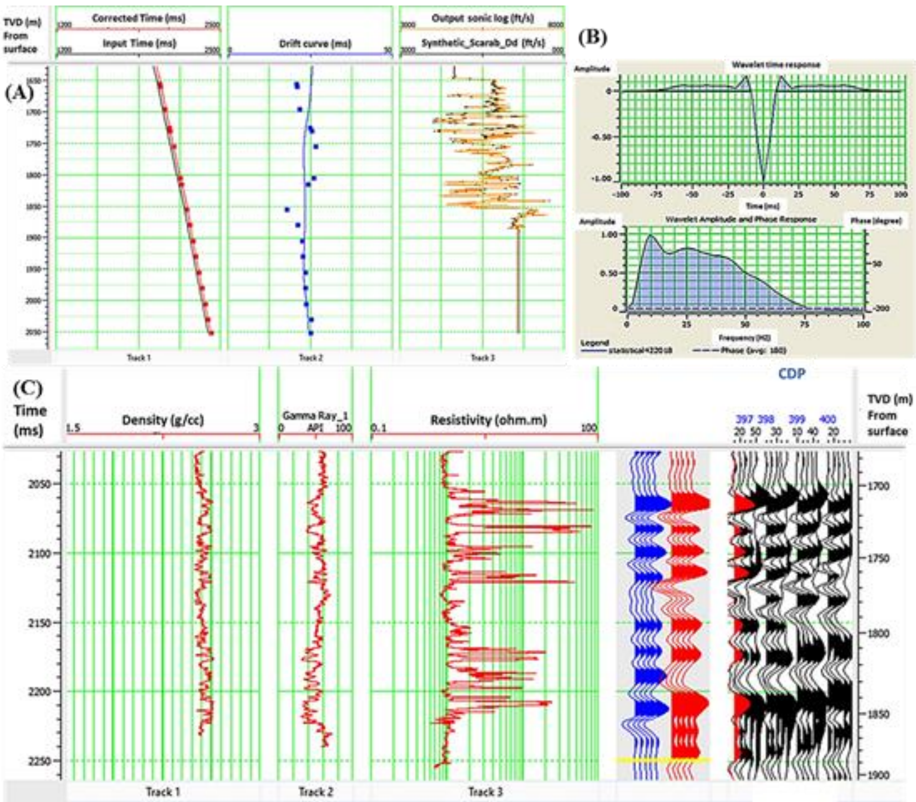


Fig. 3: (A) An example of the check-shot correction of Scarab-Dc well. A drift-curve (in blue middle track) is defined as a measure of the difference between the two time-depth relationships, shown on the left-hand side. On the right panel, the black track is the original sonic log and the red track is the theoretically corrected sonic log. (B) Statistical wavelet with time response on top and respective amplitude spectrum on the bottom. The phase is constant 180 degrees for post-stack seismic data. (C) An example of the well tie of Scarab-Dd well. The blue seismic traces are the calculated synthetic and the red represents the real seismic data using statistical wavelet shown in (B).

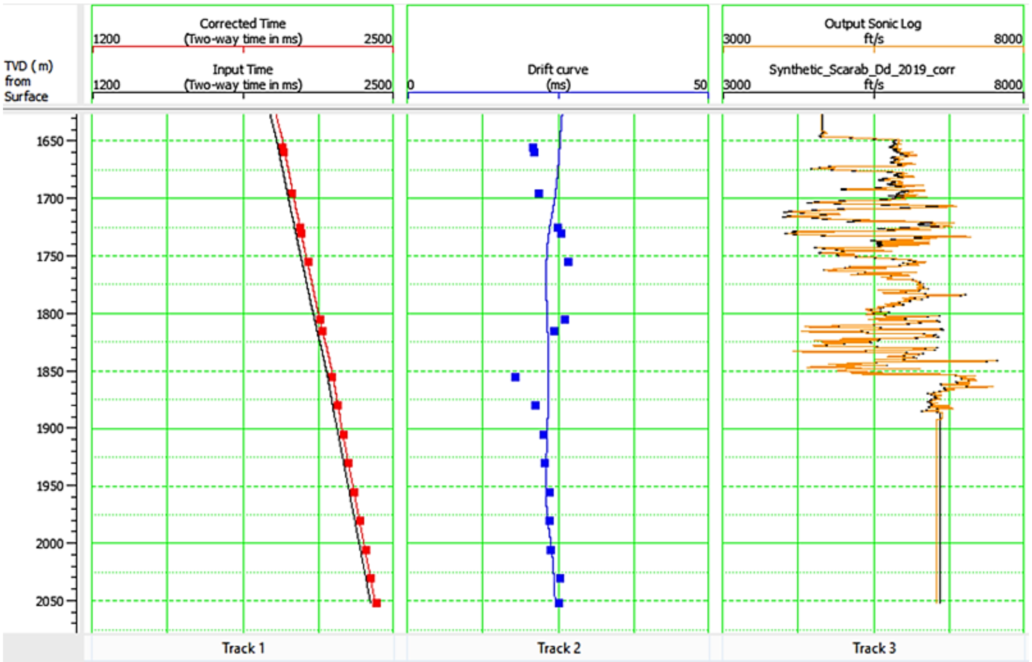


Fig. 4: An example of the check-shot correction of Scarab-De well. A drift-curve (in blue middle track) is defined as a measure of the difference between the two time-depth relationships, shown on the left-hand side. On the right panel, the black track is the original sonic log, and the red track is the theoretically corrected sonic log.

*5) The lowstand systems tract*

The basal unit in the sequence-2 is the lowstand systems tract. The lowstand systems tract is defined as the interval between transgressive surface below and maximum flooding surface at top. It is marked by low gamma ray and high resistivity (if it contains hydrocarbon), and good separation between density-neutron, as a result of sand and small streaks of shale and silt (from depth 1659m to1677m).

*6) The transgressive systems tract*

The second unit in the sequence-2 is the transgressive systems tract. This unit gives a moderate value of Gamma ray, low resistivity, and small separation between density-neutron. Lithologically, it consists of shale, silt, and small streaks of sand. The transgressive systems tract is bounded from base by the transgressive surface and bounded at top by maximum flooding surface. The maximum flooding surface is defined by low resistivity, high gamma ray and no separation between density-neutron. It mainly consists of shale with small streaks of sand and silt (from depth 1650m to1659m).

7) *The lowstand systems tract*

The third unit in the sequence-2 is the lowstand systems tract. The lowstand systems tract is defined as the interval between transgressive surface below and maximum flooding surface at top. It is marked by low gamma ray and high resistivity (if it contains hydrocarbon), and good separation between density-neutron, as a result of sand and small streaks of shale and silt (from depth 1639m to1650m).

8) *The highstand systems tract*

The upper unit in the sequence-2 is the highstand systems tract. It is defined by high gamma ray, low resistivity, and no separation between density-neutron (from depth 1598m to1639m).

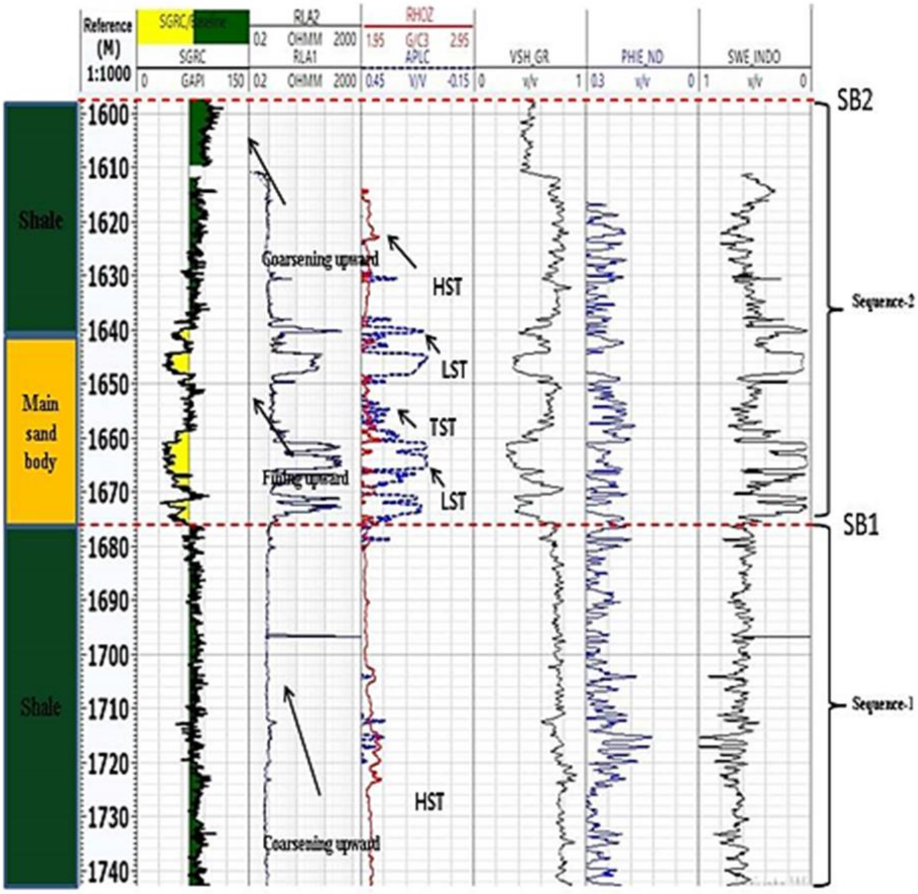


Fig. 5: Sequence stratigraphic classification of Scarab-Da well based on wireline log data.

9) *Sequence stratigraphic classification of Scarab-Db well based on wireline log data*

10) *Sequence-1*

The lower unit in the Pliocene El Wasteni Formation of the Scarab -Db well (Fig.6). This sequence consists of the four-fold subdivisions of the sequence the lowstand, transgressive, lowstand and highstand systems tracts based on logging data (gamma ray, resistivity and density-neutron logs) (from depth 1677m to1764m).

11) *The lowstand systems tract*

The basal unit in the sequence-1 is the lowstand systems tract. The lowstand systems tract is defined as the interval between transgressive surface below and maximum flooding surface at top. It is marked by low gamma ray and high resistivity (if it contains hydrocarbon), and good separation between density-neutron, as a result of sand and small streaks of shale and silt. (from depth 1758m to1762m).

12) *The transgressive systems tract*

The second unit in the sequence-1 is the transgressive systems tract. This unit gives a moderate value of Gamma ray, low resistivity, and small separation between density-neutron. Lithologically, it consists of shale, silt, and small streaks of sand. The transgressive systems tract is bounded from base by the transgressive surface and bounded at top by maximum flooding surface. The maximum flooding surface is defined by low resistivity, high gamma ray and no separation between density-neutron. It mainly consists of shale with small streaks of sand and silt (from depth 1745m to1758m).

13) *The lowstand systems tract*

The third unit in the sequence-1 is the lowstand systems tract. The lowstand systems tract is defined as the interval between transgressive surface below and maximum flooding surface at top. It is marked by low gamma ray and high resistivity (if it contains hydrocarbon), and good separation between density-neutron, as a result of sand and small streaks of shale and silt (from depth 1727m to1745m).

14) *The Highstand Systems Tract*

The highstand systems tract is defined as the interval between maximum flooding surface at base and sequence boundary. It is defined by high gamma ray, low resistivity, and no separation between density-neutron, as a result of shale and small streaks of silt. The upper unit in the sequence-1 is the highstand systems tract. It is defined by high gamma ray, low resistivity, and no separation between density-neutron (from depth 1677m to1727m).

15) *Sequence-2*

The upper unit in the Pliocene El Wasteni Formation in the Scarab-Db gas Field is the sequence-2. This sequence consists of the three-fold subdivisions of the sequence; lowstand, transgressive and highstand systems tracts from base to top. Sequence two is bounded from the base with sequence boundary one, and from the top with sequence boundary two (from depth 1623m to 1677m).

16) *The lowstand systems tract*

The basal unit in the sequence-2 is the lowstand systems tract. The lowstand systems tract is defined as the interval between transgressive surface below and maximum flooding surface at top. It is marked by low gamma ray and high resistivity (if it contains hydrocarbon), and good separation between density-neutron, as a result of sand and small streaks of shale and silt (from depth 1670m to1677m).

17) *The transgressive systems tract*

The middle unit in the sequence-2 is the transgressive systems tract. This unit gives a moderate value of Gamma ray, low resistivity, and small separation between density-neutron. Lithologically, it consists of shale, silt, and small streaks of sand. The transgressive systems tract is bounded from base by the transgressive surface and bounded at top by maximum flooding surface. The maximum flooding surface is defined by low resistivity, high gamma ray and no separation between density-neutron. It mainly consists of shale with small streaks of sand and silt (from depth 1660m to1670m).

18) *The highstand systems tract*

The upper unit in the sequence-2 is the highstand systems tract. It is defined by high gamma ray, low resistivity, and no separation between density-neutron (from depth 1623m to1660m).

19) *Sequence stratigraphic classification of Scarab-Dc well based on wireline log data*

20) *Sequence-1*

The lower unit in the Pliocene El Wasteni Formation of the Scarab-Dc well (Fig. 7) consists of the upper part of the highstand systems tract based on logging data (gamma ray, resistivity, and density-neutron logs) (from depth 1767m to1800m).

21) *The Highstand Systems Tract*

The highstand systems tract is defined as the interval between maximum flooding surface at base and sequence boundary type 2 at top. It is defined by high gamma ray, low resistivity, and no separation between density-neutron, as a result of shale and small streaks of silt (from depth 1767m to1800m).

22) *Sequence-2*

The upper unit in the Pliocene El Wasteni Formation in the Scarab-Dc well is the sequence-2. This sequence consists of the four-fold subdivisions of the sequence; lowstand, transgressive, lowstand and highstand systems tracts from base to top. Sequence two is bounded from the base with sequence boundary one, and from the top with sequence boundary two (from depth 1652m to 1767m).

23) *The lowstand systems tract*

The basal unit in the sequence-2 is the lowstand systems tract. The lowstand systems tract is defined as the interval between transgressive surface below and maximum flooding surface at top. It is marked by low gamma ray and high resistivity (if it contains hydrocarbon), and good separation between density-neutron, as a result of sand and small streaks of shale and silt. (from depth 1716m to1767m).

24) *The transgressive systems tract*

The second unit in the sequence-2 is the transgressive systems tract. This unit gives a moderate value of Gamma ray, low resistivity, and small separation between density-neutron. Lithologically, it consists of shale, silt, and small streaks of sand. The transgressive systems tract is bounded from base by the transgressive surface and bounded at top by maximum flooding surface. The maximum flooding surface is defined by low resistivity, high gamma ray and no separation between density-neutron. It mainly consists of shale with small streaks of sand and silt (from depth 1703m to1716m).

25) *The lowstand systems tract*

The third unit in the sequence-2 is the lowstand systems tract. The lowstand systems tract is defined as the interval between transgressive surface below and maximum flooding surface at top. It is marked by low gamma ray and high resistivity (if it contains hydrocarbon), and good separation between density-neutron, as a result of sand and small streaks of shale and silt (from depth 1681m to1703m).

*26) The highstand systems tract*

The upper unit in the sequence-2 is the highstand systems tract. It is defined by high gamma ray, low resistivity, and no separation between density-neutron (from depth 1652m to1681m).

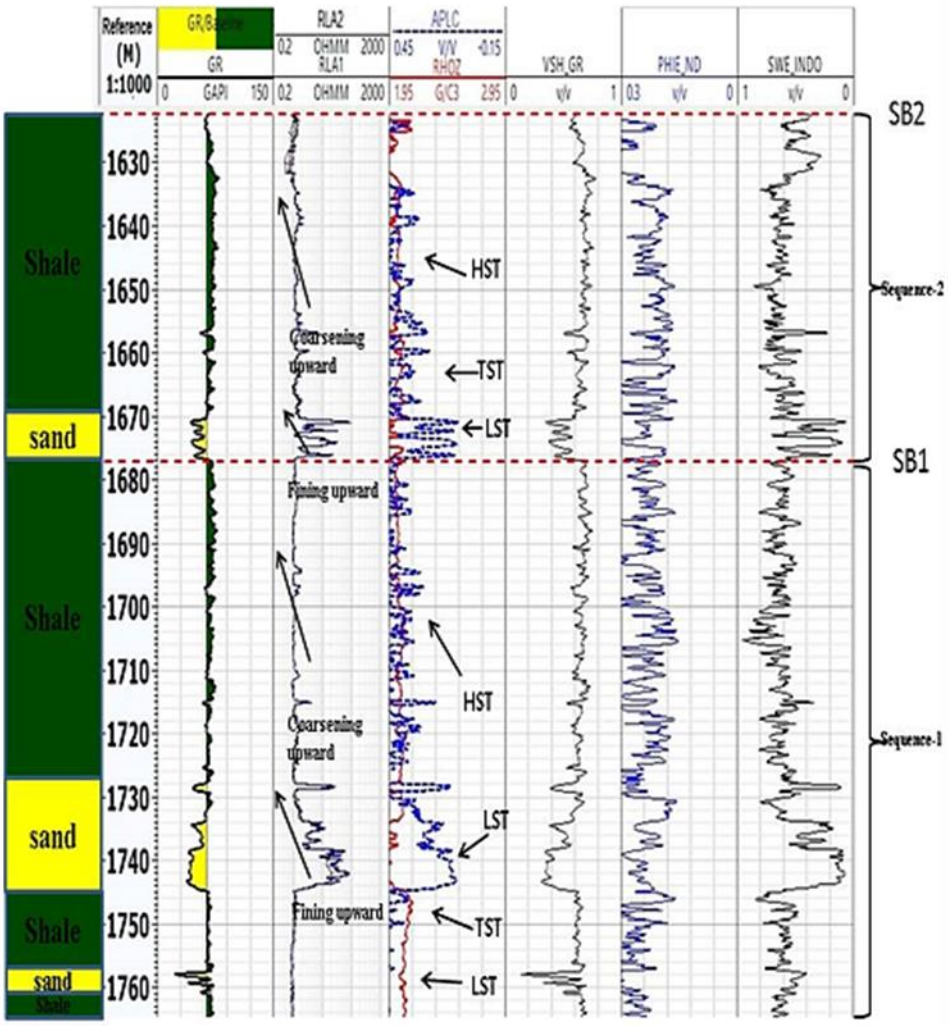


Fig.6 Sequence stratigraphic classification of Scarab-Db well based on wireline log data.

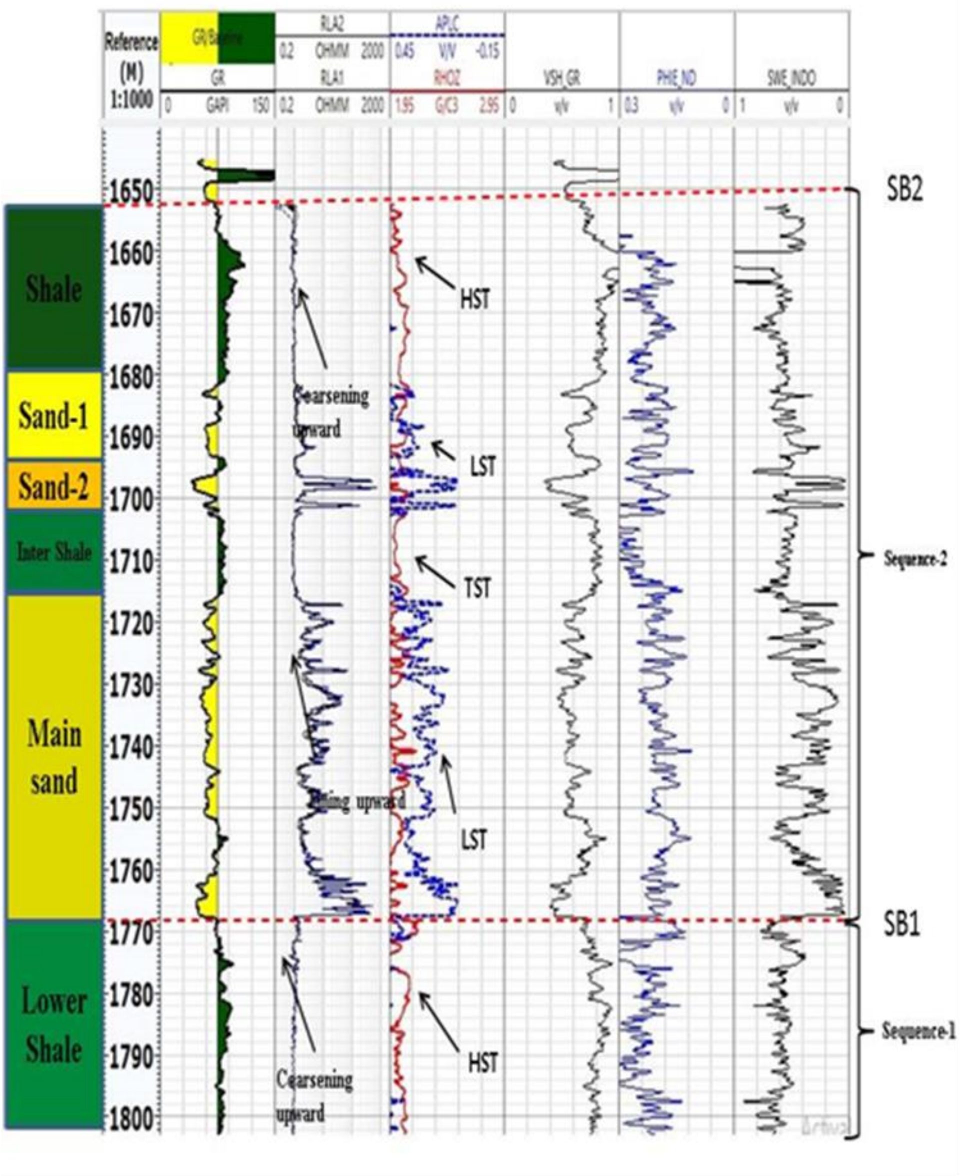


Fig.7 Sequence stratigraphic classification of Scarab-Db well based on wireline log data.

27) *Sequence stratigraphy of the West Delta Deep Marine (WDDM) based on well logs and seismic dataset.*

The recorded parasequences were correlated across the NW Nile Delta area to represent the lateral distribution of these parasequence. The recorded arranged from older to younger and separated by sequence boundaries. The detailed investigation of the seismic reflection profiles traversed the study area has enabled to classify the Miocene-Recent succession into six third-order depositional sequences. These sequences are here in referred as; the Miocene sequence MS1, Miocene sequence MS2 the Pliocene sequence one PS1, the Pliocene sequence two PS2, the Pliocene sequence three PS3 and the Quaternary sequence QS. Generally, these depositional sequences vary from south to north of the study area and even in the dip direction from that of strike direction (Figs.8-10) The identified depositional sequences are bounded with five sequence boundaries arranged from base to top as: SB1, SB2, SB3, SB4 and SB5.

28) *The Miocene sequence (MS1)*

The first sequence is incomplete in the study area where it is represented by the highstand system tract which represents the upper part of the Sidi Salem Formation (the rest of the sequence is not accessible in the study area).

29) *The Miocene sequence (MS2)*

The Miocene sequence (MS2) includes Rosetta and Abu Madi Formations. The Miocene sequence (MS2) represents a good marker on the examined seismic reflection profiles due to their high amplitude, high continuity and high contrast between the MS2 below and the PS1 above. Commonly, it appears as two closed parallel reflectors extended through most of the study area.

30) *Sequence Boundaries*

Sequence boundaries are generated by a relative fall in sea level that may be produced by changes in the rate of tectonic subsidence or by changes in the rate of eustatic rise, as long as those changes result in a net loss of accommodation space. Also, sequence boundaries are surfaces that in places show evidence of subaerial and or submarine erosion and basin ward shift in lithofacies.

Two types of sequence boundaries are recognized in coastal deposits, where rocks are subject to subaerial exposures. These boundaries have been termed type-one and type-two. Type-one sequence boundary characterized by subaerial exposure and accompanying subaerial erosion associated with stream rejuvenation.

A basin wards shift of fades, downward shift in coastal onlap and onlap of overlying strata. The sequence boundaries specially type one, readily identifiable on seismic lines due to the underlying truncation and overlying onlap relationships.

31) *Sequence Boundaries (SB1)*

The MS2 was developed on the SB1 (sequence boundary 1) which is the deepest recognized sequence boundary in the studied succession and represents the end of the MS1.

32) *Sequence Boundaries (SB2)*

The PS1 is often bounded with the SB2 below and the SB3 above. SB2 represents the end of the Messinian crises and the grounds on the sediments of the Pliocene were accumulated**.**

33) *The Pliocene Sequence One (PS1)*

The Pliocene sequence one (SP1) represents the lower part of the Kafr El-Sheikh Formation which developed with an overall progressive trend. According to the composite logs in most of the studied wells, this sequence is composed entirely of shale with minor streaks of sands. It is clearly evident on the seismic reflection profiles and well documented from the well data, therefore, it can be traced all over the examined seismic reflection profiles.

The reflectors of the PS1 are characterized by variable amplitude and low continuity. It also exhibits parallel to subparallel, divergent, and oblique internal reflection configuration as a result of slumping and sliding shale masses on the irregularities of the underlying SB2 (sequence boundary 2).

34) *Sequence Boundaries (SB3)*

SB3 is the most prominent sequence boundary; it lies within the Kafr El-Sheikh Formation between the PS1 and PS2. It characterized by moderate amplitude and moderately continuity.

35) *The Pliocene Sequence two (PS2)*

The Pliocene sequence two (PS2) comprise the sediments of upper part of Kafr El Sheikh Formation with highstand system tract. The reflectors of this parasequence are moderate to low amplitude, low continuity, parallel to sub parallel and sometimes hummocky.

36) *Sequence Boundaries (SB4)*

Generally, the SP2 was developed directly on the SB3 and end with SB4. The SB4 coincides with the contact between Kafr El-Sheikh and El-Wastani Formations. Seismically, the SB4 characterized by low to moderate amplitude with moderately to low continuity.

37) *The Pliocene Sequence Three (PS3)*

The Pliocene sequence three represents the entire of El Wastani Formation which recorded in all the drilled wells of the study area. The PS3 is generally characterized by parallel to sub parallel, low to high amplitude reflection with moderate to low continuity.

38) *Sequence Boundaries (SB5)*

Generally, the QS was developed directly on the SB5. The SB5 coincides with the contact between Kafr El-Sheikh and El-Wastani Formations. Seismically, the SB5 characterized by low to moderate amplitude with moderately to low continuity.

39) *The Quaternary sequence (QS)*

The Quaternary sequence comprise the Mit Ghamr and Bilqas formations, which is the last identified rock unit in the study area. It rests directly on the SB4 that remarks the end of the PS3. Lithologically it consists of sand and shale.

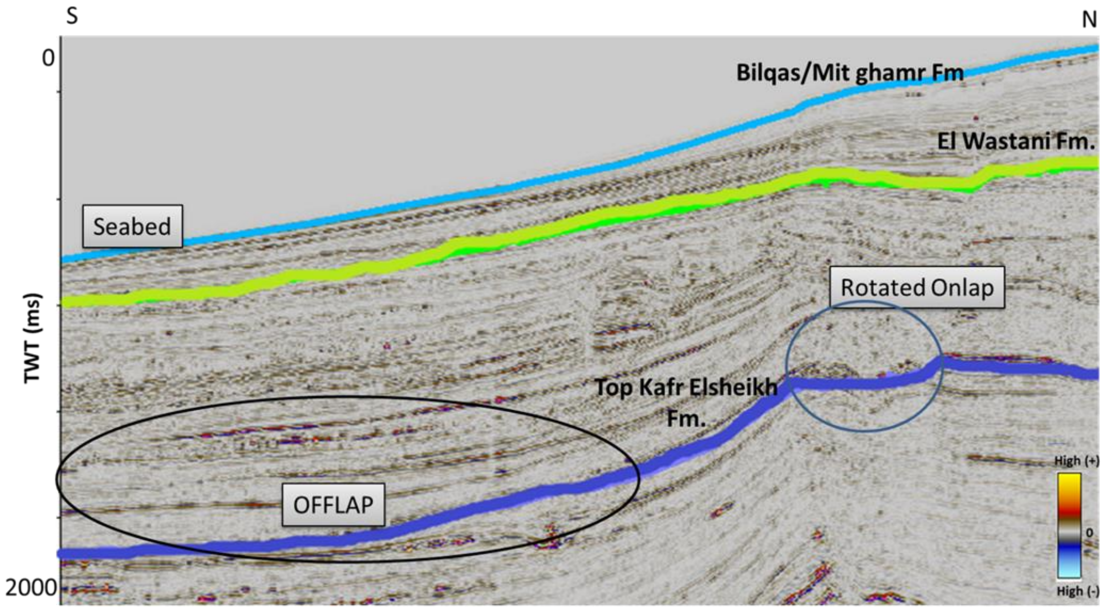


Fig. 8 Seismic section shows the identified depositional sequence and some stratigraphic terms.

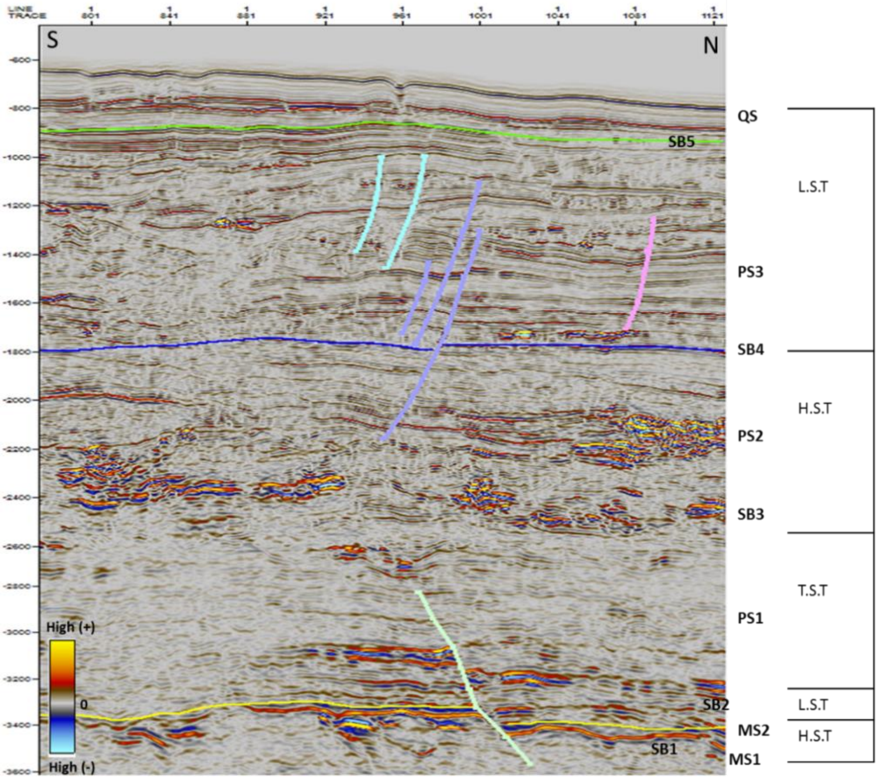


Fig. 9 Seismic section shows the identified depositional sequence and their sequence boundaries. MS: Miocene sequence; PS: Pliocene sequence; QS: Quaternary sequence; SB: Sequence Boundary.

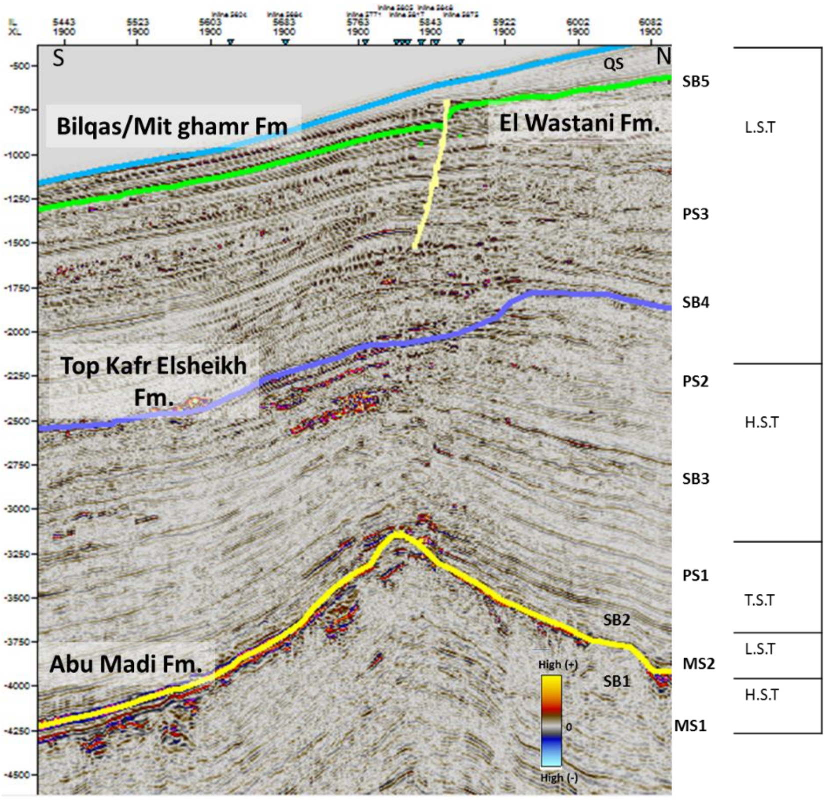


Fig. 10 Seismic section shows the identified depositional sequence and their sequence boundaries. MS: Miocene sequence; PS: Pliocene sequence; QS: Quaternary sequence; SB: Sequence Boundary.

## IIV. Conclusions

The present study deals with use of wireline well logs and 2D seismic dataset in sequence stratigraphic interpretations and classification of the Miocene-Pliocene sequences in the Scarab gas Field, West offshore Nile Delta, Egypt.

The recorded parasequences were correlated across the NW Nile Delta area to represent the lateral distribution of these parasequence. The recorded arranged from older to younger and separated by sequence boundaries. The detailed investigation of the seismic reflection profiles traversed the study area has enabled to classify the Miocene-Recent succession into six third-order depositional sequences.

These sequences or cycles from base to top are:

1) Cycle 1 is represented by a major part of Sidi Salem Formation.

2) Cycle 2 is represented by interval from the top part of Sidi Salem Formation to the top of Abu Madi Formation.

3) Cycle 3 is represented by the lower part of Kafr El Sheikh Formation.

4) Cycle 4 is represented by the middle to topmost part of Kafr El Sheikh Formation.

5) Cycle 5 is represented by El Wastani Formation.

6) Cycle 6 embrace Bilqas/MitGhamr Formation (Seabed).

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