CONCLUSIONS

The Jhura dome, investigated by the author is located in to the northwest of the Bhuj city and comprises of the Middle Jurassic rock sequence in the Mainland of Kachchh having total thickness of about 600 meters and covers the ~65 sq. km area.

The important observations are as follows:

⇒ The Middle Jurassic rocks of the Jhura dome comprises of two Formations; the lower –Jhurio Formation and the upper Jumara Formation which are further divided in to seven and four members respectively.

⇒ Stratigraphic sequence of the Jhura dome consists of both, carbonate and mixed siliciclastic-carbonate sediments. The clastic (oolitic) carbonate rocks are present at four different stratigraphic levels in the sequence of the Jhura dome.

⇒ The entire sequence of the Jhura dome is subdivided into following eight informal lithofacies.

- Dhosa Oolite Subfacies (DOs)
- Greenish Grey Shale Lithofacies (GGSL)
- Rippled Marked Calcareous Sandstone Shale Lithofacies (RMCSSL)
- Nodular White Well Bedded Limestone Subfacies (NWWLs)
- Conglomerate Lithofacies (CL)
- Golden Oolite Subfacies (GOs)
- Calcareous Silty Shale Lithofacies (CSSL) and
- Badi Limestone Subfacies (BLs)

⇒ Presence of both intraformational and extraformational conglomerates indicate typical characteristic of storm generated facies

⇒ Oolitic facies (=clastic limestone) are very well developed. These in association with overlying and underlying siliciclastic as well as carbonate facies suggest extensive

sediment reworking and slow net sediment accumulation rates in shallow marine (shoreface-offshore), agitated, moderate to high energy conditions and occasionally witnessed storms (wave ripples).

⇒ A sudden increase and decrease in terrigenous influx (siliciclastic sedimentation) is responsible for kick-off and drowning of non-clastic carbonate growth and subsequently development of carbonate facies.

⇒ Majority of the lithofacies are highly bioturbated and consist of abundant trace fossils. Conglomerate lithofacies and Greenish grey shale lithofacies are devoid of trace-fossils. Certain bands of various lithofacies like DOs, RMCSSL etc. are rich in Ammonites, Belemnites, Brachiopods and Bivalves.

⇒ Based on the trace fossils morphology author has been able to recognize five ethological groups including *Cubichnia, Repichnia, Pascichnia, Fodinichnia* and *Domichnia.*

⇒ 71 ichnospecies of 37 ichnogenera have been identified and systematically described from the Jhurio and Jumara Formations of the Jhura dome.

⇒ Trace-fossils genera such a *Rhizocorallium uraliense, Parahentzscheliana ardelia, Phoebichnus trochoides, Pilichnus dichotomus, Phymatoderma isp., Cosmorhaphe carpathica, Chondrites recurvus* and number of *Zoophycos* species are reported for the first time from the sedimentary sequence of the Jhura dome.

⇒ *Zoophycos* trace fossil is the most conspicuous character of the Dhosa Oolite subfacies.

⇒ Six distinct ichnoassemblages (*Protovirgularia* IA*; Zoophycos – Chondrites* IA*; Rhizocorallium – Pilichnus* IA*; Ophiomorpha* IA*; Thalassinoides – Palaeophycus* IA and *Taenidium – Keckia* IA) are recognized and described. These ichnoassemblages have provided important information on palaeoenvironment, bathymetry, wave and current energy, food availability, oxygen conditions and substrate consistency.

⇒ 18 distinct ichnoguilds were reported, documented and described for the middle Jurassic sediments of the Jhura dome.

⇒ Following three ichnofacies have been identified and described.

- *Skolithos* Ichnofacies (Shoreface)
- *Cruziana* Ichnofacies (Lower shoreface – Offshore)
- *Zoophycos* Ichnofacies (Shelf)

⇒ Six identical sequence stratigraphic surfaces (Drowning unconformities, Correlative Conformities, Transgressive Surfaces, Regressive Surfaces, Flooding Surface or Transgressive ravinement surfaces and Maximum Regressive Surface) have been established and described together with a transgressive lag deposit and a maximum flooding surface for the entire sedimentary sequence of the Jhura dome.

⇒ The 3rd order Highstand – Transgressive system tracts identified and described in detail as TST-I, HST-I, TST-II, HST-II, TST-III, HST-III and TST-IV in chronological order, give cyclic tectono-sedimentary, Transgressive-Regressive (T-R sequence) sedimentation pattern. Few 4th order parasequences are picked on the basis of flooding surfaces within transgressive system tract-III and IV.

⇒ The various depositional environments such as Shelfal below SWWB (BLs - TST-I), Transition to Lower Shoreface (GOs and CSSL - HST-I), Upper Offshore to Lower Offshore (CSSL - TST-II), Lower Shoreface above FWWB (GOs - HST-II), Lower Offshore to Shelf (NWWLs and GOs – TST-III), Lower Shoreface to Middle Shoreface (CSSL and RMCSSL - HST-III) and Upper Offshore (DOs - TST-IV) are recognized.

⇒ Based on the sedimentological and ichnological data three dimensional depositional model of the shallow marine sequence of the Jhura dome sediments of the North Central Mainland Kachchh have been reconstructed.