ACKNOWLEDGEMENTS

I take this opportunity to extend my deep sense of gratitude to my research guide Prof. Nilesh P. Bhatt for his dedicated help, advice, inspiration, encouragement, patience, affection and continuous support throughout my Ph.D. work. During our course of interaction in the last five and half years, I have learnt extensively from him, including how to raise new possibilities, how to regard an old question from a new perspective, how to approach a problem by systematic thinking and datadriven decision making. Without Prof. Bhatt's guidance and constant feedback this Ph.D. would not have been achievable.

I also take this opportunity to acknowledge the contributions of my teacher Prof. Prabir Dasgupta in shaping my career. In fact, he is the person who introduced me to the fascinating world of Sedimentology during my college days in Presidency College (now Presidency University), Kolkata. Prof. Dasgupta's diligence, sincerity, scientific acumen, profound knowledge and personality have always been cherished by me and act as an everlasting source of inspiration for me.

I would like to thank Prof. L.S. Chamyal, the Head of the Department of Geology (The Maharaja Sayajirao University of Baroda, Vadodara), for providing the infrastructural facilities for the successful completion of this Ph.D. work.

Being an employee of Oil and Natural Gas Corporation Limited (ONGC Ltd.), I gratefully acknowledge the higher management for granting me the permission for pursuing the Ph.D. work. I thank Shri Chunilal Chatterjee (Chief General Manager) from ONGC Ltd. (Western Onshore Basin, Vadodara) for giving his consent to supervise the thesis as external supervisor.

My sincere thanks go to Dr. Shuvabrata De (post-doctoral fellow in Shandong University of Science and Technology, China), who was my batch mate in Presidency College, for his generous support during the research work.

I would like to acknowledge the support received from Dr. Rashmikant N. Talati and Kushal Chavare from the Department of Geology (The Maharaja Sayajirao University of Baroda, Vadodara, Gujarat) and Dr. Siddharth P. Prizomwala from the Institute of Seismological Research (Gandhinagar, Gujarat) during the course of this Ph.D. work.

Very special thanks go to my wife Unmesha for her constant support and encouragement during the course of this Ph.D. work. Since I am in job and have been simultaneously undertaking the research work, it was quite difficult for me to cater at the same time to the three fold and varied requirements of my work centre, household and research. But the support and affection that I received from my

wife and of course her sacrifices, made this arduous journey really possible. During the course of this long journey, she never complained about the little time I could spend with her but was always enthusiastic to stand by my side and verily took pride in my work and achievements.

At this juncture, I acknowledge my parents for their constant support and encouragement. In fact, their love and association with Science instilled in me, during my formative years, an ardent desire to pursue it as my career. Their struggles in life made me firmly believe that anything can be achieved through patience and perseverance. I also acknowledge my parents-in-law for their encouragement and the sense of pride they take in my work.

Last but not least, I acknowledge all my well-wishers and all the persons who knowingly or unknowingly contributed in successful completion of this journey.