

Ph.D. Thesis

## ACKNOWLEDGEMENT

At the moment of finalizing my research I must acknowledge the strength, energy and patience that almighty God has given during the process of completion of this research work. I would also like to express my sincere thanks and deep sense of gratitude to my guide Prof. (Dr.) A. S. Patel, Professor, Civil Engineering Department, Faculty of Technology and Engineering, The M. S. University of Baroda for his personal and keen interest in my research. The thesis was shaped and brought to an end with his continuous fruitful discussions, suggestions and contributions. Without his inspiration, encouragement, help and guidance it would not have been possible to carry out this research.

I express my sincere gratitude to Prof. (Dr.) H. M. Patel, Head of Civil Engineering Department, Faculty of Technology and Engineering, The M. S. University of Baroda for his continuous thorough guidance, encouragement, inspiration and genuine help in model simulation. I thank him for providing all the facilities available to his command.

I am thankful to the authority of The M. S. University of Baroda and my Faculty for their supportive role at various stages of this research.

I express my heartnest appreciation and thanks to Dr. Sena, Senior Scientist, Central Soil and Water Conservation and Research Training Institute (CSWCRTI), Vasad, for their thorough guidance for the software "GMS 6.0 and conceptualizing and using the groundwater model and their focused approach and effective inputs at various stages of this research work. I also express my thanks to shri Bhagyesh C. Contractor and Reeple D. Shah for help in using the groundwater model.

I express my heartiest appreciation and thanks to Prof. (Dr.) H. J. Dalwadi, Professor, Civil Engineering Department, B. V. M. Engineering College, Sardar Patel University, Vallabh Vidyanagar for his guidance related groundwater modelling.

I take this opportunity to express my sincere thanks to Prof. P. N. Sutaria and Prof. P.D. Vyas, both EX-Head of Civil Engineering Department, for helping me administratively for collection of data for my research work.



## Ph.D. Thesis

I would like to especially thanks to Dr. G. S. Joshi, Dr N. J. Shrimali and Shri G. H. Bhatti, All Associate Professors, Civil Engineering Department, who inspired and provided technical guidance, moral support as well as encouragement during this research work.

I would also like to thank sincerely to Dr. S. S. Mujumdar, Dr. S. D. Shah, Shri G.I. Joshi, Shri V. M. Rana, Shri S C. Rana, Shri A. R. Shah, Shri L.I. Chuhan, Shri N. G. Shah, Mrs. K. A. Shah, the staff members of Civil Engineering Department and all other colleagues, for their co-operation and help whenever I needed during my course of research.

I cannot forget most noble person like Dr. V. M. Yagnik, EX-Managing Director, GWRDC, Gandhinagar, Gujarat for his warm support and help in obtaining information and data. I am highly thankful to Shri K. D. Verma, Retired Geologist, GWRDC, for his help in collecting data of the study area.

I am heartily thankful to various Government agencies like Gujarat Water Resources Development Corporation (GWRDC), Gandhinagar, State water Data Centre (SWDC), Gandhinagar, Gujarat Engineering Research Institute (GERI), Vadodara, Vadodara Irrigation Circle (VIC), Vadodara, Mahi Irrigation Circle (MIC), Nadiad, Central Water Commission (CWC), Gandhinagar, Vadodara Mahanagar Seva Sadan (VMSS), Vadodara, etc. for providing me data for the research and analysis.

I also remember the help rendered by my beloved students Mr. Vijaykumar H. Gohil, Ms. Nita Bhattacharya and Mr. Mitun M. Patel through their M. E. dissertation research on the topic related to my research. I am thankful to all those who have directly or indirectly helped and supported me during the entire period of my research work.

Lastly, this acknowledgement would be incomplete without mentioning the pain staking efforts and patience of my family. No words are adequate to express my indebtedness to my parents for their blessings and good wishes. To them I bow in the deepest reverence.

(M.B. Patel) Ph.D. Student

December - 2013 Vadodara.