ACKNOWLEDGEMENTS

With deep sense of gratitude, I take this opportunity at first to thank my supervisor Dr Sudesh Yadav Sir who has taken so much pain for my Ph.D. from the beginning to the last. He has facilitated my research in various ways, all of which cannot be written here. Throughout my research he has provided me his invaluable suggestions and expert guidance, constant support with encouragement and constructive criticism, without which it was quite impossible for me to complete this document. I express my sincere thanks to Prof V. K. Jain for helping and guiding from time to time towards the successful completion of this work.

I am also thankful to successive Deans of the School Prof. J. Behari, Prof. V. K. Jain, Professor K. G. Saxena and Prof. Sudha Bhattacharya for their kind support and providing all the facilities for my Ph.D. during their tenure as the school head. Without their kind support, this type of Ph.D. from a student like me was impossible. Among them I would especially like to thank Prof. J. Behari for making my research so eventful.

I am also grateful to Prof. V. Rajamani for giving the book of N. C. Brady of soil science as a prize during the Ph.D. course work, which will be inspiring me throughout my life. The lessons he taught will help me throughout my life. My sincere thanks to Prof. A. K. Attri for his encouragement and invaluable suggestions at the time of need for completion of my Ph.D. with in the stipulated time. I also render my thanks tp Prof J. SubbaRao and Prof L. K. Pandey for their motivation from time to time. I express my sincere thanks to Dr J.Tripathi for providing ICP-AES facilities and other laboratory help. Especially I am more grateful for providing MQ water and ICP-AES facilities as both was necessary to complete my PhD within stipulated time.
I am highly thankful my senior Dr. Ankit Tandon to help me generally all the times and particularly at the time of analysis. I am also thankful to Satyamanyu sir, Mr. Rakesh ji, Mr. Pawan ji, Ms. Shweta ji, Mr. Sandeep ji and Mr. Krishna Kumar. They all helped at all the times. I am also thankful to my lab attendants Mr. Arun jie and Pandey ji for their kind help.

I am also thankful to my friends Pradeep, Kushagra, Deepak, Somnath, Rakesh ji, Shashprabha, Akanksha ji and Shivaji for helping and encouraging during my research. All the other seniors, juniors and friends at School of Environmental Sciences are acknowledged for their good company and help.

I am heartily grateful to my all the teachers especially to the primary teachers whose teaching has helped me always including in this work. My sincere thanks to all the CIF personnel Dr. P.D. Gayakwad, Mr. B.D. Sharma, Mr. Bhardwaj, and Mr. Rawat for their kind help and cooperation at CIF, SES, JNU. I also thank the school office staff Sh S. D. S. Rawat and Amreek ji and Sh M. K. Prabhakar, the present Administrative officer of the school, Sh Sachdeva, the previous AO of the school.

The financial assistance in the form of fellowship provided by the UGC through JNU during this research is duly acknowledged. At last but not the least, I am grateful to my family members for their constant support through my life, research and stay at JNU. I am solely responsible for any error in this thesis.

Aditya Kumar Pathak