

DEDICATION

This thesis is dedicated to the two people I admire most -
my parents.

ACKNOWLEDGEMENTS

I would like to thank my advisor, Marc Edwards,
for his skilled guidance, persistence, optimism and patience.

Thanks also for the invaluable logistical assistance of
Laurie McNeill, Steven Kvech, Paolo Scardina, and Jason Davis.

Finally, I would like to thank Patrick,
from whom I draw my strength and sanity.

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AUTHOR'S PREFACE

Each chapter of this thesis is a separate manuscript and is formatted to the specifications of the journal to which it will be submitted. The first chapter, entitled “Copper in the Urban Water Cycle,” will be submitted to *Critical Reviews in Environmental Science and Technology*. The second chapter, “Long Term Effects of Temperature, Chlorine and Organic Matter on Copper Corrosion By-Product Release in Soft Drinking Waters,” will be submitted to *Water Research*. The final chapter “Organic Matter and Copper Corrosion By-Product Release: A Mechanistic Study,” will be submitted to *Corrosion Science*.

Although the three chapters are separate manuscripts, they have been logically organized to tell a cohesive story. The first chapter is a comprehensive synthesis of the extensive anecdotal literature on copper in the urban water cycle. In that chapter copper plumbing corrosion is implicated as a key copper source. On the basis of that finding, two phases of specific laboratory research were pursued. Chapter 2 attempts to answer the question, “What factors exacerbate or mitigate copper corrosion by-product release in highly corrosive (soft, low alkalinity) waters?” The final chapter provides a mechanistic basis for interpreting those findings and, in the process, develops a unified framework that explains a wide range of unusual by-product release data in the literature.