

A cluster of water bubbles and droplets of various sizes, some large and prominent, others small and scattered, against a light blue background.

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WATER FINANCE

Public Responsibilities and
Private Opportunities

A wide, shallow waterfall with multiple cascades of water falling over rocks, creating a misty spray at the base.

NEIL S. GRIGG

Water Finance

*Public Responsibilities
and Private Opportunities*



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Dedication

I would like to dedicate the book to the men and women who are laboring to solve the world's water problems with effective tools such as private initiative, appropriate regulation, and social justice for all. Some of these people have high profiles, such as staff of the Bill and Melinda Gates Foundation, and others work behind the scenes, such as those who build village-level water systems for non-governmental volunteer organizations such as the Rotary Club or Water for People. Government solutions are needed for some water problems, but in the end it will be the business approach to water management, broadly defined, that solves the problems.

Preface

Water is a giant global business with annual revenues of over \$200 billion in the United States alone. In the decades to come the United States must replace its aging infrastructure, which has a replacement value of over \$1 trillion. Utilities, industries, and governments must find innovative ways to address these needs without sacrificing basic needs, such as safety of drinking water or reliability of water for industries and energy production. This is creating many innovations, such as the transfers, exchanges, and water banks explained in Chapter 20.

While the water business is large and important and offers up many sensational stories about emergencies and disasters, in many ways it is hard to understand. To explain it as a business, my first thought was to illustrate how it works by presenting its organization and statistics, along with brief examples. After heading down this path, I faced an unexpected challenge: how to make this mass of information interesting?

Some authors and journalists make it interesting by picking out incidents to create good stories. Some even produce movies, like *Chinatown*, which is about the Los Angeles water system, or *Erin Brockovich*, which had villains who contaminated the drinking water. Giant floods, searing droughts, and climate change also make good material for movies. The sensationalism in these movies and books does not tell the full story of the water business, however.

A related problem is how to explain the business so that it does not seem like a collection of odds and ends. After all, what connection does the plumbing department at your hardware store have with the lake where you swim and water ski? That connection is obvious when you think about it, and it became the organizing concept for the book, which is: The water business is about all aspects of handling water.

My main involvement with the water business has been on the big-system side, with its dams, reservoirs, large pipes and pumps, and the like. These mainly involve utilities, government agencies, consulting firms, and the groups that derive livelihoods from running these systems. As I worked on different water problems, I came to appreciate the links between the reservoirs and the work of plumbers, and I learned that many more people

were involved in the water business than I thought. I knew that its public side was large, but it was a revelation to learn how large the private side is, with its house connections, sprinkler systems, and plumbing systems for a vast array of commercial and industrial facilities.

So, the book has a lot of facts and figures, but its main purpose is to explain the whole water business as the integrated business that it is. I have to admit, however, that you may have to work hard to make the case for integration because some water linkages are crowded out by linkages to higher-profile industries, such as electric power or health care.

I hope the book will be interesting and useful to people in business who are interested in water and that it will explain the business to the one million people who work directly in the water industry or with its suppliers. These include many technical and nontechnical workers who are focused on their specific missions and do not think much about water as a business. To my fellow engineers, for example, the presentation will seem like a different way to look at what they do, as they plan, design, construct, and operate water systems.

As a final note, I have been impressed by the large numbers of business associations where attention is given to water issues. To support my university work, I follow many magazines, online newsletters, conferences, and trade shows. I have tried to collect their water issues and integrate their meanings to explain the water business. At the end of the day, it is in these meetings and publications where you learn most about the water business.

Neil S. Grigg
December 17, 2010

Acknowledgments

Many people helped me to understand the water business as we crossed paths. Maybe the starting point was as a kid as I watched a contractor dig up a house sewer and studied the primitive storm drainage system in our neighborhood. I also benefited from father-and-son time fishing in the Alabama River and its tributaries, which introduced me to the problems of water pollution and its effects on the ecology of streams. Years later, I found myself studying water subjects at the university and getting my first job as a consulting engineer, which opened up due to flood damage in Colorado.

A number of inspiring mentors and teachers helped my education in water. At West Point I was fascinated by fluid mechanics, and one of my professors was Frank Borman, who later became the commander of *Apollo 8*, the first space mission to circle the moon. Other professors inspired me with their experiences in water, including work in many developing countries. I especially appreciated the inspiration of Maurice L. Albertson, a long-time professor at Colorado State University. He showed us the practical sides of water management, and later he explained the close links of water to poverty.

After I became a college teacher, I had the good fortune to be associated with Murray B. McPherson, the director of the American Society of Civil Engineers' program on Urban Water Management. Along with his associates, Mac did pioneering work on the water business and left a legacy of inspiration to his protégés in utilities, consulting firms, and universities. Mac had been a public health service officer during World War II, and his peers in public health had made many other contributions to the water business. For example, Dan Okun, a leader at the University of North Carolina and in the drinking water industry, has also left a terrific legacy. In particular, Dan alerted me to dramatic changes in the UK water industry and later to the needs of water distribution infrastructure.

During recent decades I have benefited from association with water industry professionals in utilities and especially through work of the Water Research Foundation, which is the research arm of the water supply industry. Working with its staff and many professional men and women in the

industry has given me a real appreciation for their experience, knowledge, and dedication.

In preparing the manuscript, I received valuable help from Wiley editors Bill Falloon, the executive editor of Finance and Investment, and from Meg Freeborn, my development editor. Claire Wesley helped with the production and Tiffany Charbonier added creative touches. I appreciate their continued help in developing and publishing the book.

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PART
One

**Structure of the
Water Business**