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Disclaimer

The information contained in this book is intended to provide an introduction and orientation to considerations that may arise with brownfields remediation and redevelopment in Canada and particularly in the City of Kingston. The book is not intended to contain professional advice, nor does it represent any views other than those of the individual authors. Parties dealing with particular brownfield sites or projects should seek specific advice from qualified professionals and relevant government authorities.

Preamble

This book grew out of a chance meeting between Joseph Davis and me, when in March 2004 we both attended Kingston's first brownfields conference entitled, "Rethinking Brownfield Development", at Queen's University School of Urban and Regional Planning. This conference was sponsored by the City of Kingston and the Ontario Professional Planners Institute. Our mutual interest in and respective experience with brownfields led to discussions, resulting in the idea of a book on the subject, with emphasis on the City of Kingston. My own interest in contaminated sites dates back to 1977, long before the term "Brownfield" was in common use, when I conducted an early study of the Davis Tannery. This site, like many old industrial sites in the City of Kingston, is situated on the water, in this case the Great Cataraqui River, which flows into Lake Ontario at its confluence with the St. Lawrence River.

We met in September of 2006 to discuss a plan to document the history of brownfields in Kingston, to include scientific, technical, social, planning and political aspects. The idea seemed timely, bearing in mind the recognition of Kingston as a leader in brownfields clean-up and redevelopment, and the increasing interest in and progress with the topic, Canada wide, with Ontario arguably being in the forefront (British Columbia might vie for this position). The book would be multi-authored, involve private and public sector people and could provide opportunities for undergraduate and graduate students to become involved as authors or research assistants.

In November 2006, I gave a seminar at Queen's School of Environmental Studies, on the Davis Tannery and the evolution of attitudes, regulations and technology over the past three decades with respect to brownfields. Joseph was in attendance along with Steven Rose of Malroz Engineering. The possibility of writing a book was raised at the seminar and several students expressed interest. By the end of 2006, a draft table of contents and possible list of participants was prepared. Possible participants were contacted, in order to identify potential authors, resource persons and generally "test the water". The response was very positive! In February 2007, a Brownfields Book

Steering Committee was formed including Joseph Davis, Steven Rose, Harry Cleghorn, and me. A draft Table of Contents was produced and a list of persons to be involved was developed.

The Steering Committee discussed the list of contributors and advisors for the book. The final product, with twenty two authors, includes ten university faculty members, six people who were graduate or undergraduate students when they wrote their chapters, four private sector and two public sector professionals and a number of further advisors and interviewees. The book represents a wide range of perspectives and expertise, covering social, technical, legal and political aspects, which is what we set out to accomplish. Of particular interest from an educational aspect, was the involvement of Queen's University students in the project, from the Faculty of Law, The School of Urban and Regional Planning, the Department of Geological Sciences and Geological Engineering, the Department of Biology and the School of Environmental Studies.

In the spring of 2007, grant applications to Queen's University, for summer student support, and to the Community Foundation of Greater Kingston, for funds to allow students to attend two workshops on brownfields, were both successful. In July 2007 an anonymous benefactor offered to pay the cost of producing the book. During the balance of the year 2007, writing of the early chapters of the book proceeded, along with some case studies, written by Queen's University students. A meeting with the publisher followed in 2008. More case studies from farther afield were written in 2008, and major editing finished in November 2008.

Because of the integration of disciplines that ideally are brought to bear on brownfield issues, brownfields can be viewed as "perfecting an environmental paradigm".

Pamela Welbourn, Editor-in Chief - November 2008.

A Short Guide for the Reader

This book has been designed to be suitable for the general reader but more detailed references are included to permit its use for research as well. Although there are relationships among the chapters and frequent cross-references, each chapter is nevertheless a self-contained entity, so that the reader will be able to treat this as a reference book, using only the chapters and sections for which he or she has interest or need.

The book has thirteen chapters, as well as introductory articles from citizens of Kingston who are in public office. The thirteen chapters are arranged in three sections; each chapter begins with a list of the headings within the chapter and a short summary of the respective approach that has been taken.

The basic chapters as well as the case studies reflect the respective interests, specializations and styles of the authors. There has been no attempt to make major editorial changes for uniformity in style or treatment. As a result, the case studies tend to illustrate the varied perspectives of different individuals on these complex issues, the many approaches to the development of brownfields, the types of problems encountered in the process, both technical and social, and the diverse outcomes that are possible. Because of the nature of the respective subject matter, some chapters are of necessity more lengthy and technical, or more theoretical, than others.

The first section, *Chapters 1-5*, sets the general context and deals with history, definitions, science including toxicological issues, legal and regulatory matters, and technical aspects of brownfields. The second section, *Chapters 6-10*, is based on the Kingston experience and includes case studies with technical, political and social dimensions relevant to brownfields development both in Kingston and other jurisdictions. Finally, in *Chapters 11-13*, the scope has been broadened to include case studies from other parts of Ontario and elsewhere in Canada. In one

sense every case is unique, yet there are also items in common among the cases. Although limited in number, the selected cases in **Chapters 11 and 12**, i.e., outside Kingston, are intended to be illustrative, for comparison and contrast with those for the City of Kingston, while highlighting the variety of approaches and techniques for redevelopment. The final chapter provides conclusions and integration through lessons learned.

Brownfields governance is a dynamic enterprise subject to evolution and change. When this book went to press, discussions on possible amendments to the main brownfield regulation, Ontario Regulation 153/04, were ongoing in the interests of addressing existing challenges within the legislative framework and to update standards.

The Steering Committee believes that this book documents some of the challenges and successes that the City of Kingston has experienced and continues to experience, when facing issues of brownfield development. It addresses similar issues in other jurisdictions. The important lessons learned may benefit persons with a general interest as well as specialists in the various social, political, technical or legal fields.

Pamela Welbourn, Harry Cleghorn, Joseph Davis, Steven Rose,
Steering Committee.

Brief Biographies of Authors

Bruce Anderson is a Professor of Civil Engineering at Queen's University, and a cross-appointed Professor in the School of Urban and Regional Planning at Queen's. He has a long-standing professional interest in brownfields remediation (as part of sustainable city development), and he was a member of the Task Force responsible for the creation and implementation of the City of Kingston brownfields revitalization and community improvement plan.

John Andrew is an Assistant Professor in the School of Urban and Regional Planning and Director of the Executive Seminars on Corporate and Investment Real Estate; both at Queen's University. He is also cross-appointed to the Queen's School of Environmental Studies. He holds a Ph.D. and a Master's of Science in Planning from the University of Toronto.

Lalita Bharadwaj is an Assistant Professor in the College of Nursing at the University of Saskatchewan. Dr. Bharadwaj is a toxicologist with expertise in the area of Human Health Risk Assessment. She has conducted a variety of risk assessments for specific contaminated sites, explicit and unique exposure scenarios and for materials used in the construction industry.

Harry Cleghorn is President of Cleghorn & Associates, an environmental services consulting firm, incorporated in 1996. He has conducted environmental audits of industrial sites in the rail transportation, oil & gas, iron & steel manufacturing sectors. He is past Co-Chair of the Kingston Environmental Advisory Forum and is currently Vice-Chair of the FOCUS Kingston Steering Committee.

Joe Davis is a career civil servant. He has worked in the Municipal sector for over 28 years and has taught the Municipal Clerks and Treasurers course. He has led the City of Kingston in creating an awarding winning recycling and composting program and most recently in leading the development of the City of Kingston's Community Improvement Plan – Brownfields project Areas 1A and 1B, which was nominated for a Brownie Award from the Canadian Urban Institute.

Mallory Drysdale completed both her master's and undergraduate degrees at Queen's university, specializing in environmental geology and toxicology. She is currently pursuing a career in environmental consulting.

Kim Fowler is a Full Member of the Canadian Institute of Planners with over 19 years of practice in 3 provinces, including the Regional Municipality of Niagara, Province of Alberta, the Islands Trust and the cities of Victoria, Chilliwack and Port Coquitlam. Her sustainability work includes co-project managing the City of Victoria's Dockside Lands, which has achieved the highest LEED™ Platinum score in the world and designing a 12-activity integrated sustainability initiative for the City of Port Coquitlam. Kim is currently Director of Sustainability for the City of Victoria, British Columbia.

Peter Hodson is a fish toxicologist with 21 years' experience with the Department of Fisheries and Oceans and Environment Canada, and 14 years' experience as a Professor of Biology and of Environmental Studies at Queen's University. His research addresses the role of chemical metabolism in the toxicity of organic chemicals to embryonic fish and is relevant to problems of oil spills and contamination of sediments by polynuclear aromatic hydrocarbons.

Heather Jamieson holds faculty appointments in the School of Environmental Studies and the Department of Geological Sciences and Geological Engineering at Queen's University. She is a geochemist with active research programs on metal-contaminated soils, lake sediments, airborne particles and household dust.

Gail Krantzberg is Professor and Director of the Dofasco Centre for Engineering and Public Policy in the School of Engineering at McMaster University. Gail completed her M.Sc. and Ph.D. at the University of Toronto in the field of ecotoxicology, and then worked for the Ontario Ministry of Environment from 1988 to 2001, as Coordinator of Great Lakes Programs and Senior Policy Advisor on Great Lakes, where remediation of historic industrial sites were central to her science and policy research.

Kelly McNicol is currently an Urban Planner with the City of Quinte West and is a graduate of the Masters of Planning Program at Queen's University where he focused his independent studies on brownfield redevelopment in Kingston and other medium sized municipalities. His Master's report topic laid the framework for his section on the Davis Tannery for this book.

Ray Machibroda, P.Eng. M.Sc. is a geoenvironmental engineer with P.Machibroda Engineering. Over the last 20 years he has assessed and/or remediated numerous contaminated sites including rail yards, landfills, power generating stations and wood treating facilities located throughout Western Canada.

Nathan Manion is a graduate of Queen's University (B.Sc Biology, 2003) and completed his Masters degree in Biology at Queen's University in 2007, where his thesis focused on mercury contamination in sediment of the Great Cataraqui River in Kingston and its relation to former industrial and brownfield properties. Nathan is currently an Assistant Professor at Loyalist College in Belleville, Ontario where he teaches courses in chemistry and biology.

Jacquelyn Norris is an Environmental Science graduate from Queen's University where her undergraduate thesis focussed on a case study of the Block D former brownfield. Her passion lies in environmental science, with specific interest in conservation, toxicology and remediation issues. Currently, she is an environmental consultant in Langley, BC.

Bruce Pardy is an Associate Professor in the Faculty of Law at Queen's University. He has taught environmental law at law schools in Canada, the United States and New Zealand, and has written extensively in the areas of environmental governance, ecosystem management and environmental liability. Before becoming an academic, Professor Pardy was a litigation lawyer at Borden Ladner Gervais LLP in Toronto, and presently sits as a part-time member of the Ontario Environmental Review Tribunal.

Victoria Remenda is a professor in the Department of Geological Sciences & Geological Engineering at Queen's University. Her research interests include the hydrogeology of clay-rich, unlithified deposits (aquifers) as well as the interaction between groundwater and lakes. She has served as Chair of the Inner Harbour Working Group, Kingston Environmental Advisory Forum and was instrumental in that capacity in implementing the Belle Park educational depots program and helping to create an infrastructure for collaborative research by students from Queen's University and Royal Military College on soil remediation at the site.

Allison Roberts graduated from Trent University and has recently graduated in the Environmental Studies Masters program at Queen's University. Allison's research focuses on the role that environmental non-governmental organizations play in brownfield remediation and redevelopment.

Steven Rose is a founding principal of Malroz Engineering Inc., a firm specializing in the investigation and remediation of contaminated sites. He is a registered professional engineer in Ontario, California, and Alaska, and a registered professional geoscientist in Ontario. Mr. Rose has more than 25 years' experience as a consultant to industrial and government clients both in Canada and internationally, and is an Adjunct Professor in the Department of Geological Sciences and Geological Engineering at Queen's University.

Marcia Wallace is on secondment to the Ministry of the Environment and was the former and first Brownfields Coordinator with the Ontario Ministry of Municipal Affairs and Housing. In that role, Marcia was the Province's strategic policy and program coordination lead on brownfields, and a one-window point of contact for individuals and groups with an interest in brownfield remediation and redevelopment. She has a Ph.D in Urban Planning from the University of Waterloo and is a Registered Professional Planner.

Sean Warshawski, a recent graduate from Queen's University Law School, is currently a Student-at-Law with Burnet, Duckworth and Palmer LLP in Calgary. Prior to attending law school, Sean worked as an environmental consultant in the oil and gas fields of Northern British Columbia and Alberta after earning a Bachelor of Science degree in Biology from the University of Alberta.

Pamela Welbourn is a retired professor of environmental science from the University of Toronto and Trent University in Peterborough. She has consulted extensively on the environmental toxicology of brownfields and is currently an adjunct professor at Queen's University in Kingston.

Graham Whitelaw is an Assistant Professor in the School of Environmental Studies and School of Urban and Regional Planning at Queen's University in Kingston. His research deals with environmental assessment, regional planning sustainability and First Nations. He has worked as a civil servant with the Ontario Ministry of the Environment and has provided consulting services to government and civil society organizations in the area of environmental planning and management. He is currently Chair of Save the Oak Ridges Moraine Coalition and a director with the Oak Ridges Institute for Applied Sustainability.

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