

Pipeline Hydrotransport with Applications in the Oil Sand Industry



Clifton A. Shook, Randall G. Gillies, R. Sean Sanders

Pipeline Hydrotransport with Applications in the Oil Sand Industry provides a summary of the principles of fluid mechanics as they apply to pipeline hydrotransport and especially slurry flow. In addition to providing a resource for engineers and scientists working in the oil sand industry, it will be of interest throughout the mineral and chemical process industries.

Chapter list:

1. Basic Concepts and Definitions
2. Slurries
3. Pipeline Flow of Homogeneous Slurries
4. Heterogeneous (Settling) Slurries
5. Deposition Velocities for Settling Slurries
6. Pressure Drop Predictions for Heterogeneous (Settling) Slurries
7. Measurement Techniques
8. Hydrotransport in the Oil Sand Industry
9. Slurry Pumps

To Order Contact:

Information Services
Saskatchewan Research Council
125 - 15 Innovation Boulevard
Saskatoon, SK Canada S7N 2X8
Fax: (306) 933-7446
publications@src.sk.ca

The price is \$100.00 CDN plus GST and Shipping costs

PREFACE

The purpose of this book is to provide a summary of the principles of fluid mechanics as they apply to pipeline hydrotransport and especially slurry flow. Because undergraduate fluid mechanics courses rarely mention slurry flows, it has been necessary to begin with a review of the basic concepts before proceeding to subjects of interest to the designer or plant engineer.

The book has evolved from lectures given by two of the authors in a post-graduate course which was offered as part of a Diploma program in Oil Sands Technology by the University of Alberta. In preparing their lectures, it became evident that a textbook was required and that this textbook should try to summarize the results of the numerous laboratory investigations which have been sponsored by this industry. Much of this research has been undertaken by the staff of the Pipe Flow Technology Centre of the Saskatchewan Research Council in Saskatoon, Saskatchewan. In addition to providing a resource for engineers and scientists working in the oil sand industry, it is to be hoped that the

book will prove to be of interest throughout the mineral and chemical process industries.

The Saskatchewan Research Council is a non-profit Crown Agency of the Government of Saskatchewan. Its primary mandate is to advance the economy of the province through scientific research. To maintain a core of experienced staff and to sustain its physical resources, the Council encourages its staff to engage in contract research in areas in which they have developed expertise and to collaborate with university researchers. In the particular case of pipeline hydrotransport this endeavour has been continuous since 1960.

Because the field and its applications to the oil sand industry are developing rapidly, it was decided to employ a format in the publication of the book which would facilitate the inclusion of further material or revisions. The involvement of the Saskatchewan Research Council in publishing the book is an indication of the importance which it places upon its activity in this field.

ACKNOWLEDGEMENTS

In many respects this book is a tribute to many years of research cooperation involving Canadian industry, government and university groups. In sponsoring systematic laboratory investigations the Athabasca oil sand industry has demonstrated and exemplary willingness to share knowledge and encourage scientific inquiry. It is appropriate to mention Syncrude Canada, Suncor Inc. and Shell Canada in this regard and to note that the more recent participants in the industry give every indications of making similar contributions.

Although the authors are researchers they wish to acknowledge the important contributions to the technology which have arisen through their interaction with designers and plant engineers. They also wish to recognize the seminal contributions made by Canadian academics, notably Professor K.C. Wilson of Queen's University and Professor J.H. Masliyah of the University of Alberta.

The authors also wish to express their appreciation of the contributions made by the staff of the Saskatchewan Research Council, during numerous research investigations and in the production of this book.

We are indebted to Melissa McKibben and Jason Schaan for their critical reviews of this manuscript. Their comments and helpful suggestions improved both the content and its presentation.

Finally, since writing a book consumes a substantial quantity of time and effort outside of normal working hours, we thank our wives: Patricia Gillies and April Banigan for their support through this period.

May 2002