Book Review Paste and Thickened Tailings – A Guide (Second Edition)

By Steve Slottee, Partner, PasteThick Associates

Water recovery, impoundment safety and environmental sustainability, are tailings disposal issues demanding increasing attention in the minerals industry. Paste and thickened tailings technology is becoming recognized as an alternative to conventional tailings storage facilities. Anyone concerned with tailings disposal should be aware of this design option for tailings handling and disposal.

Paste and thickened tailings refer to the underflow of tailings thickeners that exhibit non-settling solids character at concentrations higher than produced by normal plant thickeners. Thickening to paste and thickened tailings concentrations reduces the volume of water reporting to tailings storages, and allows the elimination of conventional water retaining storage facilities and the associated environmental risks. Storage densities are higher, and timer for consolidation is shorter. Closure of a thickened tailings disposal sites becomes much less difficult. The technology is also used for the diposal of mine tailings underground, either as an alternative to surface disposal or with the addition of cement as an engineered support structure.

“Paste and Thickened Tailings – A Guide (Second Edition)” provides information to those concerned with mineral tailings disposal. The Guide will assist personnel in evaluating the potential of the technique for their operations, and to relate to and brief their design consultants. The Guide can be used by someone new to the application of paste and thickened tailings and is an easy and efficient way to review the principles of the technology. The first edition was published in March 2002. The second edition addresses the rapid evolution and implementation of paste and thickened tailings technology in the intervening years as well as new information.

CHAPTERS

Making Tailings Disposal Sustainable discusses the economic/engineering and environmental/social benefits of paste and thickened tailings.

Rheological Concepts describes important rheological concepts and measurement techniques and their application to the design of impoundment, pipeline, and thickeners.

Material Characterisation addresses tailings properties important to the design of paste and thickened tailings deposits. Tailings placement properties such as beach geometry, shear strength and liquefaction are reviewed.

Slurry Chemistry discusses chemical and colloidal conditions that affect the settling, consolidation and rheological behaviour of paste and thickened tailings.

Reagents describes the use of flocculants and coagulants for the thickening process that produces paste and thickened tailings.

Thickening and Filtration discusses the design of paste thickeners. Filters may follow a thickener to produce paste and the types of filters are reviewed.

Transport is an integral part of any paste and thickened tailings project. Pipeline transport is the most common method of transporting high-concentration tailings and the technical and economic aspects that should be considered for design are addressed.

Above Ground Disposal of tailings thickened to non-settling solids concentration has advantages and disadvantage which are discussed and compared to the conventional tailings pond. Examples of thickened tailings operations are listed.

Mine Backfill deals with the application of paste technology for the disposal of tailings underground as an alternative to surface disposal, or as an engineered product designed for s specific support function. Examples of mine backfill operations are included.

Closure touches on the long-term stability, safety and post-operational land uses for the tailings storage facility as applied to paste and thickened tailings. Control of acid mine drainage is discussed. The financial aspects to be considered are listed.

Case Studies includes examples of surface disposal of paste and thickened tailings, adding to the first edition of the Guide.

An extensive list of **References** and a **Glossary** is provided.

Steve Slottee
Partner
PASTETHICK ASSOCIATES
3625 South West Temple
SALT LAKE CITY UTAH 84115
steveslottee@pastethickassoc.com
Ph: +1 (801) 455 7233