

2 Preface

Many articles and excellent books have been written on mine water issues. This publication focuses on some of the gaps in those publications, specifically:

- why and how to close a mine
- the hydrodynamics of a flooded mine
- tracer techniques for flooded mines, and
- stratification patterns in the mine water body

Since my first contact with mine water issues in 1991, I realized that scientists and consultants from many different backgrounds are working in this field of science: e.g. mining engineers, geologists, biologists, chemists, civil engineers, environmentalists, lawyers, and regulators. For some of them, mine water issues are their daily job; others work on a project for a short time period and then never come back to mining in their career or work. Most of the books I read about mine water issues – and when I first started to think about this publication, there were not many books available – were intended for either one audience or the other.

I have attempted to bridge the gaps that exist without repeating a lot of material already published elsewhere. Therefore, there are very detailed parts of this book, which address issues that are not well covered in the mine water literature, and other sections that simply provide an overview for the novice in this field. So, some facts are covered in detail (e.g. tracer tests or mine water stratification), others are discussed briefly (e.g. treatment techniques, surface mining) and others are just missing because covering them in detail would have been beyond the scope of this publication (e.g. salt mining, solution mining). Most of the book assumes that the reader is a practitioner with a basic knowledge of natural science.

But why should you care about mine water stratification and mine water tracer tests?

Since the 1960s, it was known, that water in a flooded underground mine might stratify (Stuart and Simpson 1961; Fig. 98). Many researchers since then have mistakenly thought that stratification (which is the layering of water with different physico-chemical properties) could be used to extract unpolluted mine water from a flooded mine. Although numerous cases of flooded and stratified mines exist and have been made public, no comprehensive synopsis of the density stratification problem has been published so far. This publication will fill this gap by describing the main physical laws involved, categorizing the types of stratification, and describing several case studies.

When looking through the references, you might notice that many of them have been written in a language that you may not be very familiar with: German. This might be unusual for an English publication, but it arose from two simple but decisive factors:

The Technische Universität Bergakademie Freiberg has organized several mine water related symposia and conferences. During the organization of such conferences, it became clear that most German-speaking colleagues from industry and the authorities depend on publications written in their own language. This is probably why many aspects of passive treatment were reinvented in Germany, without detailed studies of all the English publications available. Therefore, the list of references contains German as well as English publications, giving German-speaking colleagues several references to publications in their own language.

On the other hand, if you are a reader with English as your mother tongue, you will have the opportunity to learn about research done in Germany that you might find useful.

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