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 than 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.
Contents

1 Acknowledgements ........................................ v
2 Preface .................................................. ix

Contents ................................................... xi

Abbreviations ............................................. xv

3 Introduction ............................................. 1
  3.1 Mining Issues ........................................ 1
  3.2 How to read this book ................................. 5

4 Hydrogeochemistry of Mine Water .................... 9
  4.1 Introduction ........................................... 9
  4.2 The Process Starts: Abiotic Disulphide Weathering .... 10
  4.3 The Process goes on: Metal Dissolution ............... 13
  4.4 The Process is Speeded up: The Role of Microorganisms .... 17
    4.4.1 Introduction and Metabolism .................. 17
    4.4.2 Mechanisms of Organism–Mineral Interaction .... 22
  4.5 The Process Slows Down: Buffering of the Acidity .... 23
  4.6 The Process Ends: Mineral Precipitates ............... 25
  4.7 Predicting the Post-Mining Chemical Composition .... 30
  4.8 Radionuclides in non-Uranium Mines ................ 32

5 Insights into Mine Closure .............................. 37
  5.1 Reasons for Mine Closure ............................ 37
  5.2 Post-Mining Sustainability of Mine Sites ............. 37
  5.3 Previous Mine Flooding Studies ..................... 45
  5.4 Effects Contributing to Mine Water Constituents .... 46
    5.4.1 The First Flush .................................. 46
    5.4.2 The Effects of Storm Events .................. 49
  5.5 Reasons for Mine Flooding ............................ 52
    5.5.1 General Aspects of Mine Flooding .............. 52
    5.5.2 Surface Mines ................................... 55
    5.5.3 Underground Mines ............................. 58
    5.5.4 Mine Water Inrushes ............................ 62
  5.6 Remining Abandoned Mines – A Special Type of Remediation .. 63
  5.7 Diverting Water ....................................... 67
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.7.1 Why Divert Water?</td>
<td>67</td>
</tr>
<tr>
<td>5.7.2 General Measures to Keep the Water Away</td>
<td>68</td>
</tr>
<tr>
<td>5.7.3 Physical Barriers</td>
<td>71</td>
</tr>
<tr>
<td>5.7.4 Mine Entrance Sealing</td>
<td>76</td>
</tr>
<tr>
<td>5.7.5 Quality Control Issues</td>
<td>80</td>
</tr>
<tr>
<td>5.7.6 Examples and Case Studies</td>
<td>81</td>
</tr>
<tr>
<td>5.8 Mine Dewatering</td>
<td>84</td>
</tr>
<tr>
<td>5.8.1 Introduction</td>
<td>84</td>
</tr>
<tr>
<td>5.8.2 Dewatering Techniques</td>
<td>86</td>
</tr>
<tr>
<td>5.8.3 Disposal and Treatment of Dewatering Effluents</td>
<td>89</td>
</tr>
<tr>
<td>5.8.4 Drawdown Management</td>
<td>91</td>
</tr>
<tr>
<td>5.9 Prediction of Ground Water Rebound</td>
<td>95</td>
</tr>
<tr>
<td>5.10 Unexpected Mine Water Discharges During Flooding</td>
<td>100</td>
</tr>
<tr>
<td>5.11 Mine Closure Legislation and Guidelines – Some Aspects</td>
<td>102</td>
</tr>
<tr>
<td>6 Do’s and Don’ts of Mine Closure</td>
<td>107</td>
</tr>
<tr>
<td>6.1 General remarks</td>
<td>107</td>
</tr>
<tr>
<td>6.2 Shafts</td>
<td>108</td>
</tr>
<tr>
<td>6.3 Adits</td>
<td>109</td>
</tr>
<tr>
<td>6.4 Choosing the Final Water Level</td>
<td>111</td>
</tr>
<tr>
<td>7 Hydrodynamics</td>
<td>115</td>
</tr>
<tr>
<td>7.1 Flow Patterns in Flooded Mines</td>
<td>115</td>
</tr>
<tr>
<td>7.1.1 Introduction</td>
<td>115</td>
</tr>
<tr>
<td>7.1.2 Type of Flow in Flooded Voids</td>
<td>115</td>
</tr>
<tr>
<td>7.2 Stratification in Flooded Underground Mines</td>
<td>120</td>
</tr>
<tr>
<td>7.2.1 Description of the Stratification “Problem”</td>
<td>120</td>
</tr>
<tr>
<td>7.2.2 Stratification in Underground Mines and Shafts</td>
<td>124</td>
</tr>
<tr>
<td>8 Mine Closure Flow Models and Geochemical Modelling</td>
<td>129</td>
</tr>
<tr>
<td>8.1 Introduction</td>
<td>129</td>
</tr>
<tr>
<td>8.2 Empirical Models</td>
<td>131</td>
</tr>
<tr>
<td>8.3 Analytical Models</td>
<td>133</td>
</tr>
<tr>
<td>8.4 Numerical Models</td>
<td>134</td>
</tr>
<tr>
<td>8.5 Models Based on Monte Carlo Methods</td>
<td>136</td>
</tr>
<tr>
<td>8.6 Geochemical Modelling</td>
<td>137</td>
</tr>
<tr>
<td>9 Monitoring and Sampling</td>
<td>141</td>
</tr>
<tr>
<td>9.1 Introduction</td>
<td>141</td>
</tr>
<tr>
<td>9.2 Flow Measurements</td>
<td>142</td>
</tr>
<tr>
<td>9.2.1 Direct Flow Measurement</td>
<td>142</td>
</tr>
<tr>
<td>9.2.2 Mine Water Tracing</td>
<td>169</td>
</tr>
</tbody>
</table>
9.3 Physico-Chemical Measurements ........................................ 172
  9.3.1 Sampling Procedures ........................................... 172
  9.3.2 On-site Parameters ............................................ 178
  9.3.3 Presentation of Results ........................................ 186
  9.3.4 Regression and Data Prediction ............................... 192
  9.3.5 Interpretation of Data ....................................... 194

10 Tracer Techniques for Mines ........................................... 195
  10.1 Why Conduct a Mine Water Tracer Test? ......................... 195
    10.1.1 Objectives of Mine Water Tracer Tests ..................... 195
    10.1.2 Aims of Mine Water Tracer Tests .......................... 196
    10.1.3 Possible Mine Water Tracers ............................... 197
  10.2 Tracers and their Use ........................................... 198
    10.2.1 Introduction .............................................. 198
    10.2.2 What are Tracers? ....................................... 198
    10.2.3 What are Tracers used for? ................................. 201
    10.2.4 Requirements for Tracers .................................. 202
    10.2.5 Types of Tracers .......................................... 202
  10.3 Preparation .................................................... 208
    10.3.1 Hydrogeological examination .............................. 208
    10.3.2 Selection of Injection and Sampling Sites .................. 209
    10.3.3 Which Tracers shall be used? ............................. 210
    10.3.4 How much Tracer must be used? ............................ 211
    10.3.5 Tracer Test Plan .......................................... 213
  10.4 Approval Procedure ............................................. 214
    10.4.1 Legal Regulations ......................................... 214
    10.4.2 Necessary Details within the Application ................. 215
  10.5 Execution ..................................................... 215
    10.5.1 Injection Time and Injection Type ......................... 215
    10.5.2 Sampling .................................................. 216
    10.5.3 Tracer Analyses ......................................... 218
    10.5.4 Documentation and Presentation .......................... 219
  10.6 Evaluation and Characteristics of the Tracer Test ............. 220
    10.6.1 Porous Aquifer .......................................... 220
    10.6.2 Fractured Aquifer ........................................ 221
    10.6.3 Karst Aquifer ............................................. 223
    10.6.4 Mine Aquifer (Underground Mines) ......................... 224
    10.6.5 Evaluation of Breakthrough Curves ......................... 226
  10.7 Quality Control and Data Storage ............................... 227
    10.7.1 Quality Assurance – Quality Control ..................... 227
    10.7.2 Data Storage and Management ............................. 231
11 Mine Water Treatment and Ground Water Protection ............235
11.1 Introduction ..................................................235
11.2 Physical Treatment of Inert Solids and Oil ................237
11.3 Active Treatment ..............................................240
11.4 Passive Treatment ............................................243
  11.4.1 Introduction ..............................................243
  11.4.1 Open Limestone Channels ...............................248
  11.4.3 Anoxic Limestone Drain (ALD) .........................250
  11.4.4 Aerobic Constructed Wetlands .........................251
  11.4.5 Compost (Anaerobic) Constructed Wetlands ..........255
  11.4.6 RAPS (Reducing and Alkalinity Producing Systems) ....256
  11.4.7 Reactive Barriers .......................................259
  11.4.8 Phytoremediation ......................................260
11.5 Natural Attenuation .........................................261
11.6 In-Situ and At-Source Treatment Methods ...................264
11.7 Use of Mine Water ...........................................270
11.8 Ground Water Protection ...................................275

12 Flooded Underground Mines: Case Studies ......................279
12.1 Introduction ..................................................279
12.2 Northern Anthracite Fields, Pennsylvania, USA ............281
  12.2.1 Description of Location .................................281
  12.2.2 Appearance of Stratification ...........................283
12.3 Picher Mining District, Oklahoma, USA .....................286
  12.3.1 Description of Location .................................286
  12.3.2 Appearance of Stratification ...........................287
  12.3.3 Conclusions ............................................288
12.4 North-Rhine/Westphalian Coal and Ore Mines, Germany ....289
  12.4.1 Description of Locations .................................289
  12.4.2 Appearance of Stratification ...........................291
  12.4.3 Laboratory Experiment ................................293
  12.4.4 Conclusions ............................................293
12.5 Ronneburg Uranium Mine, Thuringia, Germany ...............294
  12.5.1 Description of Location .................................294
  12.5.2 Appearance and Interpretation of Stratification ......295
12.6 Frazer’s Grove Mines, County Durham, United Kingdom ....296
  12.6.1 Description of Location .................................296
  12.6.2 Appearance of Stratification ...........................297
  12.6.3 Results and Interpretation .............................299
12.7 Frances Colliery, Scotland, United Kingdom ................300
  12.7.1 Description of Location .................................300
  12.7.2 Appearance and Interpretation of Stratification ......300
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