

# Sampling and Metal Accounting Course

ECSA Validated CPD Activity, Credits = 0.1 points per hour attended.

**HYBRID COURSE**

## Course Provider: Metal Management Solutions (Pty) Ltd

MMS' mission is to empower mining companies with the knowledge, strategies, and solutions needed to thrive in a rapidly evolving industry. We are committed to helping the industry overcome challenges, minimize risks, and achieve sustainable growth, through digital and data-driven solutions.

## Course Introduction

The primary goal of this course is to provide participants with a comprehensive understanding of metal accounting across the entire value chain and lifecycle of a mining project. This training aims to develop holistic insight into the critical role of the measurements, sampling and analyses required for metal accounting, emphasising their impact on operational efficiency, compliance, financial reporting, and sustainable business practices. This course strives to fulfill its objectives by examining the principles outlined in the AMIRA P754 code of practice for metal accounting, along with other pertinent industry standards and guidelines. It emphasizes the practical implementation of these standards and technologies while preparing for future advancements to improve current practices.

Designed for industry professionals at all levels, this two day course provides essential knowledge and skills necessary for understanding and managing metal accounting systems effectively, encompassing all stages from exploration through to closure of mining operations.

## Key Highlights:

- Learn requirements for correct sampling, reliable mass measurement and analysis of metal content in streams and production lots development of new systems monitored by Metal Accounting and Plant Performance management systems,
- Report results transparently and accurately, positively impacting company reputation, market credibility and social licence.
- Understand the broader business impact of sound Metal Accounting, facilitating operational improvements and resource sustainability.
- Gain insights into plant design and measurement system requirements for optimal Metal Accounting performance.
- Identify limitations, uncertainties, and risks in Metal Accounting systems, and how system information can be used in value added decision making and growth of knowledge.
- Support improvement of established Metal Accounting systems and development of new Metal Accounting systems for new mines, mineral processing plants and downstream customer, mineral processing plants and downstream customers, with a solid understanding of Metal Accounting's role in each stage of development of the metal value chain.

## Learning Objectives

### 1. Fundamentals and Importance:

- a. Gain a foundational understanding of measurement, sampling and analysis processes required for metal accounting and their relevance in mining operations from exploration to closure.
- b. Recognize the diverse audience of stakeholders including site management, regulatory bodies, and technology providers, and understand their specific needs and expectations.

### 2. Industry Standards and Best Practices:

- a. Familiarisation with the AMIRA P754 Code principles, requirements and methods used to assess Metal Accounting practices as well as methods of evaluating measurement systems used in mineral and metal processing plants.
- b. Explore the principles, requirements, and methods used to evaluate and enhance metal accounting and associated measurement systems.

### 3. Technical Mastery in Sampling and Metal Accounting:

- a. Identify current Metal Accounting practices, with an emphasis on correct Sampling and reliable Analytical methods, Laboratory quality assurance and quality control, Mass measurement, Bias and Error management, Data management, Reconciliation, and Reporting.

## FOR FURTHER INFORMATION CONTACT:

Camielah Jardine: Head of Conferences and Events

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b. Learn about Metal Accounting specifics, including measurement, data management, and reconciliation to ensure I am using the convention that a reliable measurements are both unbiased and precise, This objective should rather read... to ensure accurate estimation of metal contents in the materials that are processed within and along the different stages of the mining value chain analysis.

#### 4. Operational Improvements and System Enhancements:

- Develop strategies to enhance Metal Accounting practices, incorporating Sampling and Analysis techniques, for standardisation at process plants and laboratories.
- Apply knowledge to enhance system integration with plant performance systems and broader business operations.

#### 5. Digital Transformation and Future Trends:

- Understand the integration of digital tools that automate metal accounting processes, improve data reliability, and support compliance with legal and regulatory requirements.
- Discuss future trends in metal accounting, including the impact of new technologies, the circular economy, and sustainability initiatives.

#### 6. Application and Continuous Improvement:

- Use metal accounting principles throughout all stages of metal supply chain development, from material extraction to final product delivery and sales.
- Engage in an ongoing learning cycle that includes defining, measuring, analysing, improving, and controlling metal accounting processes to adapt to evolving industry challenges.

## Course Outline

### Day 1 - Understanding Fundamentals and Emphasising Industry Standards

#### Morning Session

##### Session 1: Introduction to Metal Accounting and Sampling

Overview of metal accounting in the mining life cycle and full value-chain.  
Importance and impact on mining operations, compliance, and financial reporting.

##### Session 2: Industry Standards and Best Practices

Deep dive into AMIRA P754 Code and other relevant standards.  
Discussion on the requirements, principles, and evaluation methods for metal accounting systems.

#### Afternoon Session

##### Session 3: Technical Mastery in Sampling and Assaying Techniques

[Techniques to understand and improve sampling and analytical errors and analysis processes.](#)  
Practical exercises on selecting and applying the right sampling methods.

##### Session 4: Mastering Metal Accounting Specifics

Detailed analysis of metal accounting measurement systems, data management, and reconciliation processes.  
Case studies on enhancing reliability of (meaning precise and unbiased) in metal accounting.

### Day 2 - Operational Improvements, Digital Transformation, and Future Trends

#### Morning Session

##### Session 5: Enhancements and Operational Improvements

Evaluating and identifying improvement opportunities in existing metal accounting systems. {This includes internal and external audits}. in existing systems.  
Planning and designing metal accounting systems for new projects.

##### Session 6: Digital Tools and Future Trends

Integration of digital tools and their benefits.  
Discussion on future trends such as sustainability and the circular economy in metal accounting.

#### Afternoon Session

##### Session 7: Continuous Improvement and Practical Application

Implementing continuous improvement cycles in metal accounting.  
Workshop on applying principles to real-world scenarios and engaging with ongoing learning cycles.

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## About the Presenter and Authors



### **Adolph Kleynhans - Presenter and Author**

B.Eng Chemical Engineering  
North-West University (Potchefstroom Campus)

Adolph is a Chemical Engineer with close to a decade's experience in designing, implementing and continuously improving metal accounting solutions. Co-founding the company MMS, which specialises in metal accounting software, has demanded a deep knowledge of the AMIRA P754 code and other industry standards for best practices in managing sensitive organisational data. During this tenure he has done gap analysis and metal accounting audits at more than 15 mining sites ranging from hydrometallurgy to

pyrometallurgy on various commodities including copper, cobalt, gold, platinum, rutile, uranium and molybdenum.

His deep knowledge of metal accounting has afforded him the opportunity to be a co-author and presenter of the MPTech (a company of the University of Cape Town) metal accounting training course and a consultant for SGS Global Mining Services, assisting with Metal Accounting Audits.

Adolph is a mining and technology enthusiast balancing between maintaining the principles of industry best practices, while challenging the industry with innovative technology solutions to solve modern metal accounting challenges and optimise the mining value-chain. He hopes to inspire younger generations and peers to invest in sustainable & digital mining for the future.



### **Thomas Glück - Co-Author**

Ph.D. Chemical Engineering, University of Witwatersrand  
Pr. Eng, Engineering Council of South Africa, 1985 (No. 850236)  
Fellow SAIMM, 1986  
Fellow SAIChe, 1985  
Member SME, 2012

Dr. Thomas Glück is a seasoned professional in operations and development with a career spanning over 40 years, dedicated to enhancing operational efficiency and innovation in the metal processing industry. His expertise notably extends to the critical areas of sampling, analysis, and metal accounting standards for mineral processing plants, underscored by his involvement in AMIRA's Metal Accounting project. This participation emphasises his commitment to advancing best practices and methodologies in metal accounting, closely aligning with the standards set forth in AMIRA P754. His extensive experience includes designing and executing operational sampling and analysis audits, highlighting his proficiency in ensuring the reliability of metal assessments.

Dr. Glück has held influential roles in esteemed organisations such as Hatch Ltd and Euro Manganese Inc, leading teams in the development, commissioning, and improvement of mineral, chemical, and hydrometallurgical process plants. As a prolific author with publications in hydrometallurgy and contributions to professional journals and conferences, he is recognized as a leading authority in metal processing and recovery technologies. With a Ph.D. in Chemical Engineering from the University of the Witwatersrand and a certified Six Sigma Green Belt, Dr. Glück combines academic rigour with practical application.