

## Implementation of Lean Project Management Methodology for Reducing Environmental Impact of Mining Tailings: An Industrial Case Study

**Authors :** Mohsen Alamooti, Moones Alamooti

**Abstract :** The mineral processing industry faces significant environmental challenges in tailings management, necessitating innovative approaches to waste reduction and resource efficiency. This study examines the systematic application of Lean Project Management (LPM) methodologies in mineral processing operations to address these challenges. The research demonstrates the effectiveness of LPM principles in reducing waste and minimizing environmental impacts while maintaining operational efficiency. The methodology incorporates value stream mapping, 5S implementation, and continuous improvement processes to analyze mineral processing workflows. Through systematic evaluation of operational processes, the study identifies critical waste sources and inefficiencies in tailings management. The research employs quantitative metrics to assess environmental impact reduction and resource recovery improvements. The implementation framework includes comprehensive stakeholder engagement strategies and regulatory compliance measures. The results demonstrate significant improvements in tailings management efficiency through LPM implementation. Key findings include enhanced resource recovery rates, reduced environmental contamination risks, and improved operational cost-effectiveness. The study reveals that systematic application of LPM principles leads to measurable reductions in both material waste and process inefficiencies. Furthermore, the research establishes a correlation between improved tailings management practices and enhanced community safety outcomes. The study contributes to the development of industry best practices by providing a structured approach to integrating LPM principles into mineral processing operations. The findings indicate that the LPM methodology effectively balances environmental protection with operational efficiency while generating additional economic value through improved resource utilization. This research establishes a framework for sustainable mining practices that address both environmental concerns and operational requirements, offering valuable insights for industry practitioners seeking to enhance their environmental performance while maintaining economic viability.

**Keywords :** environmental management, lean project management, mineral processing, waste management

**Conference Title :** ICBMO 2025 : International Conference on Business Management and Operations

**Conference Location :** London, United Kingdom

**Conference Dates :** November 18-19, 2025