

# 2019 HAULAGE & LOADING EXHIBITION AND CONFERENCE

MARCH 10-13, 2019

## Emerging Technologies and Trends in Open-Pit Mining



**KOMATSU**



**E&M** ENGINEERING AND  
MINING JOURNAL

**MINING MEDIA  
INTERNATIONAL**

**Coal Age**

Welcome

# Emerging Technologies and Trends in Open-pit Mining

Time flies and two years have already passed since the last Haulage & Loading conference. This conference, which is organized by *Engineering & Mining Journal* and *Coal Age* with the help of several mining companies, academics and key sponsors, is designed as a continuing education program for engineers and executives who manage open-pit mines.

The program this year follows the theme: Emerging Technologies and Trends in Open-pit Mining. A noticeable trend in the industry is a shift toward autonomous mining. There are different degrees of autonomy and several speakers will share their vision for the future and discuss how they justified making the leap to autonomous mining. In addition to technology, the 2019 Haulage & Loading program also includes several presentations that deal with improving mine safety and management skills.

With this rendition, we have a new location, the Hilton El Conquistador in Tucson, Arizona, and a new group managing the conference. What hasn't changed is the commitment to organizing a quality program of speakers.

Delegates attending this event will have a chance to network with the speakers and peers. The presentations will be available to all full-conference delegates. The full-conference registration also includes the opening reception, breakfast for all three days as well as lunch, beverages, and snacks on the exhibit floor.

The format this year places the conference in the center of the exhibit area. More than 30 mine suppliers will be on hand. At least three sponsors are supporting the event: Hilliard, Komatsu and TowHaul.

The decision to move to Tucson was an easy one to make. It's a vibrant desert community that many miners and mine suppliers call home. The Hilton El Conquistador is where the Haulage & Loading conference originally began and it's an ideal venue in copper country. This is a homecoming of sorts to a reasonable, family-friendly resort. We hope that you will join us to learn from the experience of others. It should be a great opportunity to make new friends and rekindle existing relationships.

Steve Fiscor, Publisher & Editor  
*Engineering & Mining Journal (E&MJ)*  
and *Coal Age*



# Golf Tournament

All attendees are invited to participate in the 2019 Haulage & Loading golf outing.

The format is a friendly best ball tournament that tees off in a shotgun start at 8:30 a.m. The registration fee includes green fees, practice range, cart rental, a light breakfast and lunch following the round.

This networking event gives golfers a chance to mingle and win some prizes. It is conveniently scheduled to allow time for the suppliers to participate and still have time to build their stands.

Teams will be assembled based on their handicaps. Rental clubs are available. The course is guaranteed to provide challenging, exciting play that is sure to deliver a true desert golf experience.

Sunday



## Opening Reception Western Style BBO

E&MJ and Coal Age along with Haulage & Loading sponsors will host an opening reception Sunday evening at the Lost Territory and Courtyard, which is located on the property. Delegates will get a chance to socialize in a classic western-style setting. Organizers will share the scoop on the conference and the golf prizes from earlier in the day will be awarded. Join us to meet old acquaintances and make new friends.

Monday  
March 11, 2019

## Session 1: Modern Open-pit Mining Strategies

8:30 a.m. – 10 a.m.

### The Future of Haulage and Loading

Michelle Ash, CIO, Barrick Gold

### Mine Design Considerations for the Future

Brian Yureskes, director, global business development, Komatsu Mining

### The Future of Mine Safety

Gord Winkel, University of Alberta

## Session 2: Autonomous Mining

10:30 a.m. – Noon

### Suncor's Autonomous Experience

Anne Marie Toutant, Suncor Energy

### Space Age Mining at Home

Greg Baiden, CEO, Penguin ASI

### Continuous Surface Mining to Zero Waste

Trevor Kelly, Canadian Mining Innovation Council, and Mal Carroll, Syncrude

## Session 3: Future Considerations

1:30 p.m. – 3 p.m.

### Costing Haul Road Construction or Rebuilds – Where is the value?

Roger Thompson, Curtin University

### All-electric Drive Truck

Daniel Robertson, Siemens

### Improving Mine Haul Roads by Using Advanced Instruments to Measure Haul Road Parameters

Alok Baranwal, Tata Steel

## Session 1: Modern Open-pit Mining Strategies

8:30 a.m. – 10 a.m.



### The Future of Haulage and Loading

Michelle Ash, chief innovation officer, Barrick Gold

Haulage is a fundamental part of mining, but will it be in the future? What are the emerging and current technologies, how fast are they developing and what will be their impact as they start to integrate on the mining process? What will the mine of the future start to look like as we automate, electrify, use and produce big data and AI...and how can we start harnessing these technologies? What are the risks to both adoption and non-adoption?

### Mine Design Considerations for the Future

Brian Yureskes, director, global business development, Komatsu



Many mines today are not prepared for and were not designed for immediate full autonomous operation. The systems that guide these machines struggle with complex traffic patterns. Navigating the loading and dump areas is also a serious consideration. This presentation will discuss the different levels of autonomy that are currently available to mine operators and future mine design considerations.



### The Future of Mine Safety

Gord Winkel, director, chair of David and Joan Lynch School of Engineering Safety and Risk Management, University of Alberta

Despite these positive achievements, the mine industry remains challenged with safety performance at current levels where major incidents persist in causing significant harm, loss and environmental impacts. In the face of business drivers to boost mine operations efficiency, there is additional stress on sustaining safety programs while “doing more with less.” This presentation shares leading innovations in safety that effectively reduce ongoing significant incidents while simultaneously bolstering mine operations business efficiency.

## Session 2: Autonomous Mining

10:30 a.m. – Noon

### Suncor's Autonomous Experience

Anne Marie Toutant, Suncor Energy



Suncor was the first North American miner to adopt autonomous hauler technology on a large scale. Nearly a year ago, the company announced it would incrementally roll out a fleet of autonomous haulers at its oil sands mines over the course of the next six years, starting with its North Steepbank mine. In total, the fleet would eventually comprise at least 150 Komatsu haulers. This presentation will offer an insight as to how those decisions were made.

## Session 3: Future Considerations

1:30 p.m. – 3 p.m.

### Costing Haul Road Construction or Rebuilds - Where is the value?

Roger Thompson, professor of mining engineering, Curtin University



A question many surface mine operators face is how to justify expenditure on a haul road, either as a new construction or a rebuild of an existing road. Various design methodologies can be used to build a new road, some approaches being more cost effective than others. Similarly, for a rebuild or rehabilitation of an existing road, how can investment in road improvements be justified in the context of the total cost of material haulage? This presentation examines these questions, from both conventional and autonomous haulage standpoints.

### Space Age Mining at Home

Greg Baiden, CEO, Penguin ASI



Society needs next-generation mining to forge forward. Underwater mining and mining in space will require a much different approach. Who would have thought that water would currently be the most important ore to be mined off the planet? An important consideration will include coordinated networking for multimachine control. Next-generation positioning systems will also play a crucial role in the new methodology. This presentation will focus on this application of Space Age mining to today's terrestrial operations and the advantages and disadvantages for both.

### All-electric Drive Truck

Daniel Robertson, Siemens



A mining haul truck driven by electrical wheel motors is proposed with all-electrical power sources; that is, without a diesel engine. On-board energy storage is charged from regenerative braking, and is supplemented with off-board overhead power. This innovative solution offers significant energy savings and productivity increases for haul trucks of all sizes and practically all mine profiles. Beyond eliminating concerns about emissions mandates, an all-electric truck would also remove the costs associated with maintaining a diesel engine and its components.

### Continuous Surface Mining to Zero Waste

Trevor Kelly, Canadian Mining Innovation Council, and Mal Carroll, Syncrude

The future of surface mining is upon us. The requirements for fundamental change from batch to continuous mining platforms has arrived. Industry trends have generally been going in the wrong direction and need to moved toward zero waste, improving mining intensity, labor intensity, capital and cost efficiency. The Canada Mining Innovation Council is developing and executing projects that align with the industry requirements, CMIC surface mining road map and enabling elements of open collaboration, flexible mine design, integrated digital platform and autonomous mining, to respond to these grand challenges.

### Improving Mine Haul Roads by Using Advanced Instruments to Measure Haul Road Parameters

Alok Baranwal, technologist, RM Resource & Mining, Tata Steel



In an open-cast mine, productivity, fuel consumption and speed of haul trucks are key drivers to improve safety and efficiency of mining operations. To ensure efficient haulage, haul road parameters like rolling resistance, gradient, superelevation, curve radius and road friction must be monitored and upgraded regularly. In Tata Steel Ltd. mines, a multiple-sensor-based measuring instrument was used to capture and maintain the parameters for improving haul roads.

Tuesday  
March 12, 2019

## Session 4: Safety & Health

8:30 a.m. – 10 a.m.

### Advances in Wearable Safety Products

Dan Bongers, SmartCap

### Managing Fatal Risks in Mine Equipment Operations

Douglas Jones, Freeport-McMoRan

### Actionable Intelligence to Improve Safety

Carey West, Loadscan

## Session 5: Strategies for Pit Management

10:30 a.m. – Noon

### Meeting Expectations for Profitable Production

Ross Gibbons, Thiess

### Turning Challenging Mining Conditions into Success

Tawnya Thornton, JDS Mining

### Strategies to Improve Productivity

Jared Katerenchuk, KMC Mining

## Session 6: Training & Development

1:30 p.m. – 3 p.m.

### Mine Operations Supervisor Development Program

Rick Green, Freeport-McMoRan

### Reducing Variance Through Simulation-based Training Technologies and Processes

Adam Norris, Immersive Technologies

### The Take Charge Training Concept

Gordy Williams, EDI

## Session 4: Safety & Health

8:30 a.m.-10 a.m.



### Advances in Wearable Safety Products

Dan Bongers, SmartCap

Operator fatigue-technologies have been widely available for years, yet the mining industry remains slow to embrace these. Hesitations range from perceptions of newness through to an unwillingness to engage a workforce for fear of pushback. This presentation shares a decade of learnings from fatigue-technology deployments around the globe, with several example case studies showing results and challenges. Suggestions for best practices will be provided.

### Managing Fatal Risks in Mine Equipment Operations

Douglas Jones, Freeport-McMoRan



An analysis of historical incident trends indicates that the interaction of large mining equipment with light vehicles and/or pedestrians is a significant cause of safety-related incidents. Engineering, Operations, and H&S personnel within Freeport-McMoRan have developed a policy to reduce or eliminate these interactions within both mining and processing facilities. In 2018, a site-by-site audit was conducted at all of Freeport's North and South American properties to measure compliance with this policy. This presentation will share the findings of this assessment, highlighting best practices in design, engineering, and operating procedures.



### Actionable Intelligence to Improve Safety

Carey West, Loadscan

Safety and efficiency when loading trucks is paramount. Therefore the ability to understand your payload is key. In this session, Carey West will explain the advantage of load volume scanning (LVS) systems, which provide real-time, insightful data (including 3D images) for every load. With an LVS in play, loaders and truck drivers have actionable intel, which they can use to improve safety, eliminate overloading, reduce tire wear, optimize truck loading, eliminate wasteful haul-back, and increase fill factors. You'll hear how those already using Loadscan have upskilled their workforce (with live, visual feedback) and increased their trucking factors by approximately 15%.

## Session 5: Strategies for Pit Management

10:30 a.m. – Noon



### Meeting Expectations for Profitable Production

Ross Gibbins, Thiesse

Classification of mine operators. Self-performing mine owners; mining services providers. What is the definition of profitable production? General and mining specific. How does this relate to business sustainability and why is this important? How is this influenced by pit management? What impacts profitability and/or production? What part does innovation and technology play? This presentation will explore the relationship between operating costs, capital costs and revenue.

## Session 6: Training & Development

1:30 p.m. – 3 p.m.



### Mine Operations Supervisor Development Program

Rick Green, senior superintendent , technical training, Freeport-McMoRan

The Mine Operations Supervisor Development Program is a systematic approach to develop essential skills, knowledge and abilities. The program is based on a simple business model composed of four components: physical assets, processes, people and leadership. Technical competency and business knowledge are key factors in each area of the business model. The program ensures a common foundation for Freeport's mine operations across North America. Concepts are based on best practices, continuous improvement and accepted technical theory.

### Turning Challenging Mining Conditions into Success

Tawnya Thornton, JDS Mining



Building a mine is no easy feat; it's even harder in a remote location. JDS has assisted in the development and performance of mines around the world, in a variety of challenging environments. This presentation will discuss some of our greatest operational obstacles, and demonstrate that from Brazil to Baffin Island, a lot of the big problems in open-pit mining are exactly the same.



### Reducing Variance Through Simulation-based Training Technologies and Processes

Adam Norris, regional manager, Immersive Technologies

A series of case studies will examine real world results at mining operations in North America and around the world that improved haulage productivity and machine availability through a focused continuous improvement approach using simulation as the key driver. Presentation will feature specific examples of actual projects, including methodology and results achieved. There will also be insights into new technologies available to the industry including the gamification of training.

### Strategies to Improve Productivity

Jared Katerenchuk, KMC Mining

KMC is one of Canada's largest contract miners with significant assets, knowledge and understanding in the oil sands sector. Dealing with ever-changing mining conditions, KMC has developed several strategies over the years to improve productivity in the pits.

### The Take Charge Training Concept

Gordy Williams, president, EDI



The difference between a "proactive" supervisor and a "status quo" supervisor can amount to millions of dollars in the mining business. The Take Charge approach is a dramatic departure from traditional supervisory training efforts. It focuses on results rather than classroom activities. After each compact skills unit is presented to your management team, they are required to apply the learned skills and tools "back on the job." They are held individually and collectively accountable to do this. Specially developed tools and measures are used to indicate the degree of success each supervisor achieves. These measures apply to both hard and soft skills.

*Wednesday,  
March 13, 2019*

**Session 7: Haulage & Loading Performance Workshop  
8:30 a.m. – Noon**

**Positioning Mines to Capitalize  
on Available Technologies**

**Dr. Tim Joseph, JPI Mine Equipment &  
Engineering Consultants**



Dr. Tim Joseph, a recognized authority on mining equipment performance, will lead a certificated industry short course that will permit attendees to explore how they can easily use accessible existing on-board equipment data to evaluate equipment performance. The JPI Beyond the Stopwatch workshop will highlight, through presentation, discussion and exercises, haulage and loading issues and the impact that running surfaces and load balance extend to equipment performance. This half-day workshop session will provide insights, tools and techniques using existing on-board haulage and loader data systems, to benchmark and predict adverse operational conditions. Attendees will find low hanging fruit that can be put into operational practice immediately realizing increased availability and productivity through better understanding of asset capability in your unique mining operations.



# Exhibitors

CQMS Razer	Rimex
Expander	Siemens
Flanders	SmithCo Manufacturing
Hexagon Mining	Southwestern Scale
Hilliard Corp.	Split Engineering
Immersive Technologies	Strata Worldwide
Komatsu Mining	Total Power
MTU America	Walz Scale
Philippi-Hagenbuch	

## Registration Rates & Deadlines

### Advanced Deadline

1/16/19 - 3/5/19

<b>Full Conference Delegate*</b>	<b>\$699</b>
<b>Non-exhibiting Suppliers</b>	<b>\$2,800</b>
<b>Spouse</b>	<b>\$119</b>
<b>Sonoran Desert Museum</b>	<b>\$135</b>
<b>Shopping Excursion</b>	<b>\$135</b>
<b>Golf Outing</b>	<b>\$159</b>

### Onsite

Begins 3/10/19

<b>Full Conference Delegate*</b>	<b>\$799</b>
<b>Non-exhibiting Suppliers</b>	<b>\$3,000</b>
<b>Spouse</b>	<b>\$129</b>
<b>Sonoran Desert Museum</b>	<b>\$135</b>
<b>Shopping Excursion</b>	<b>\$135</b>
<b>Golf Outing</b>	<b>\$179</b>

\*Includes engineers and management personnel from mining companies, consultants, academics, regulators, etc.

\*\*Includes admission, transportation and lunch.

\*\*\*Includes green fees, driving range, cart rental, breakfast and lunch.

## Sponsorships

**Gold Level: Komatsu Mining**

**Copper Level: Hilliard**

**TowHaul**

**E&MJ**

**Coal Age**



Hotel

## Hilton El Conquistador, Tucson

Let us surprise you with the pristine beauty of the Hilton El Conquistador, Tucson. Mining Media International has reserved a special rate of \$169 per night for Haulage & Loading attendees.

Book your room using our special link at [haulageandloading.com/accommodations](http://haulageandloading.com/accommodations)

**Deadline for reservations at the Haulage & Loading special discounted rate is February 9th. Book Now!**



# Mobile Event App

New to the conference this year will be our own Haulage & Loading Mobile Event App!

This feature-packed digital event guide will provide interactive content and activities, engaging attendees and suppliers alike.

Top features will include:

- Session agendas
- Personalized agendas
- Speaker information & presentations
- Show floor plan
- Exhibitor information
- Activity feed
- Messaging
- Networking
- And more!



New Mobile App  
& Day Trips



## guest Programs

During the conference, two off-site events are planned for spouses, significant others and family members. These trips include transportation, admission and lunch. Details will be posted to the website and advanced registration is required.

### Arizona-Sonora Desert Museum

Guests will experience a quintessential Sonoran Desert experience that includes an unforgettable fusion zoo, botanical garden, natural history museum, aquarium and art gallery.

### The Authentic Tucson Tour

Guests will explore art galleries and shops with copper and turquoise Native American jewelry.

# HAULAGE & LOADING EXHIBITION AND CONFERENCE

## MININGMEDIA INTERNATIONAL

11655 Central Parkway, Suite 306  
Jacksonville, FL 32224

Held every two years, Haulage & Loading is the conference for surface mining professionals. The event, which brings mine operators and suppliers together in an informal Arizona resort setting, focuses on improving surface mining operations in general and truck-shovel loading in particular. The technical program offers continuing education for mining engineers and mine managers.

### Interested in Attending?

Register at

[haulageandloading.com/attend/  
registration](http://haulageandloading.com/attend/registration)

### Interested in Exhibiting?

Find out more here

[haulageandloading.com/exhibit/  
become-a-sponsor](http://haulageandloading.com/exhibit/become-a-sponsor)

**Join us March 10-13, 2019 for the three  
most productive days in surface mining.**



**2019** HAULAGE & LOADING  
EXHIBITION AND CONFERENCE

