

# 2<sup>ND</sup> DIGITAL MINES 2020: BUILDING FULLY AUTONOMOUS MINES FROM PIT TO PORT

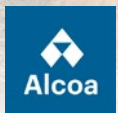
Main Conference: 1 - 2 April 2020  
Autonomous Mining Operations Site Tour: 3 April 2020  
Venue: Pan Pacific Perth, Australia

HEAR FROM  
20+ Speakers from

Resolute Mining  
Boliden  
GMG Group  
Alcoa  
Société Le Nickel  
Vale  
Codelco  
BHP  
Rio Tinto

[VIEW ALL  
INSIDE >](#)

## PARTICIPATING COMPANIES



BHP

RioTinto

eraMET

## MAJOR THEMES FOR THIS YEAR

World's First Fully Automated Mine: Resolute's \$220 Million Gold Mine Syama

Resolute 

Building Intelligent Mines Of The Future With Digital Twins And Robotics



How Vale Is Harnessing AI To Revolutionize Its Mining Operations



How Autonomous Drones Are Changing The Art Of Mineral Surveying And Mining Operations



How Codelco Is Creating The Most Advanced Underground Mines In The World



Discover Boliden's Fully Autonomous Underground Mine



## 300+ DELEGATES AND SPEAKERS IN 2019 FROM

BHP	Resolute
Citic Pacific Mining	Oz Minerals
Fortescue Metals Group	Tata Steel
Glencore	Covalent Lithium
Newmont	Consolidated Minerals
Rio Tinto	Commonwealth Bank of Australia
Roy Hill	Australian Diversified Engineering
Australian Vanadium	Department of Mines, Industry Regulation and Safety
Codelco	Epiroc
Freeport-McMoRan	Hastings Deering
Gold Fields Australia	Hatch
Teck Resources	Nokia
VALE	Thiess
South32	Scania Australia
ABB Australia	SAP
Alcoa	University of Adelaide
Debswana Diamond	Telstra Mining
Ernst & Young	Micromine
Evolution Mining	
KPMG	
Minerals Research Institute of WA	
Orica	

CLARIDEN  
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QUESTIONS? Contact us at:

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# SYAMA: THE WORLD'S FIRST FULLY AUTOMATED MINES

REGISTER BY 30 JANUARY 2020 TO AVOID PRICE INCREASE OF UP TO AU\$400!

## THE CONFERENCE AT A GLANCE

### DAY 1: WEDNESDAY, 1 April 2020

#### MAIN CONFERENCE

- Gamechanger: Rio Tinto's Koodaideri Intelligent Mine Of The Future
- World's First Autonomous Underground Gold Mine: Rolute's \$220 Million Gold Mine Syama
- Goldcorp: Harnessing AI To Revolutionize Its Mining Exploration
- Why 5G Could Be The Key To Unlocking Autonomy In Deep Mines: Boliden's Fully Autonomous Mines Experience
- How Autonomous Drones Are Transforming Mining Operations Around The World
- Moonshot Thinking: Making Space Mining A Reality With Asteroid Mining Corporation By 2025

### DAY 2: THURSDAY, 2 APRIL 2020

#### MAIN CONFERENCE

- Next Generation Autonomous Mining At BHP
- Building Intelligent Mines Of The Future
- Autohaul: Rio Tinto's Experience In Deploying World's Longest, Fully Autonomous And Heavy Haul Trains
- Future Smart Mines With Artificial Intelligence: Vale's New Artificial Intelligence Mining Center
- Intelligent Mines: Leveraging Big Data Analytics Capabilities Optimise Production, Operations , Maintenance And Reduce Downtime
- Sustainability In Mining: How Technology Is Rapidly Improving Sustainability In Mining And Successful Mine Rehabilitations Case Studies

### DAY 3: FRIDAY, 3 APRIL 2020

#### SITE VISIT

- Autonomous Drones Site Tour: This site tour will showcase how drones are transforming mining operations, surveying and explorations. You will experience live demonstrations of drones.
- Smart Mining With AI And Analytics Site Tour: This site tour will showcase how mining companies are using AI and analytics to create giant leaps of transformation in their mining operations.
- Digital Twins In Intelligent Mines Site Tour: This site tour will bring you the latest advances on how digital twins can be used to build an intelligent and fully autonomous mines.

## 5 STRATEGIC REASONS TO ATTEND THE 2<sup>ND</sup> DIGITAL MINES FORUM

1. Inspirational case studies and best practices on running and maintaining future-ready mines, from world-leading mining companies
2. Impactful discussions around the most pressing challenges and inefficiencies in the fast-changing mining landscape, and how these can be addressed
3. Learning lessons from current deployments of advanced mining technology - where it has gone wrong and what it can deliver when done right
4. Valuable networking and partnership opportunities with some of the most innovative minds at the forefront of next-generation mining
5. An exciting glimpse at the new frontier of mining in space

## PARTICIPATING COMPANIES INCLUDE:





PAN PACIFIC  
PERTH  
1 - 3 APRIL  
2020

BUILDING FULLY AUTONOMOUS MINES FROM PIT TO PORT

## GLOBAL MINING LEADERS AND SPEAKERS

WORLD'S FIRST FULLY AUTOMATED MINE:  
RESOLUTE'S \$220 MILLION GOLD MINE SYAMA



**JOHN WELBORN**  
Managing Director and CEO  
Resolute Mining



DISCOVER BOLIDEN'S FULLY  
AUTONOMOUS UNDERGROUND MINE



**DANIEL EKLUND**  
Director Technology  
Boliden



HOW VALE IS BUILDING ITS  
NEXT GENERATION AUTONOMOUS MINES



**SAMANTHA ESPLY**  
President  
Canadian Institute of Mining,  
Metallurgy and Petroleum  
Former General Manager  
(Mining Technology & Innovation) at Vale



HOW AUTONOMOUS DRONES ARE CHANGING THE ART OF  
MINERAL SURVEYING AND MINING OPERATIONS



**JOE URLI**  
Chief Remote Pilot & President  
Australian Certified  
UAV Operators Association



BUILDING INTELLIGENT MINES OF THE FUTURE  
WITH DIGITAL TWINS AND ROBOTICS



**MÉDÉRIC SUON**  
Chief Digital Officer  
Société Le Nickel



HOW VALE IS HARNESSING AI  
TO REVOLUTIONIZE ITS MINING OPERATIONS



**MALCOLM MCRAE**  
Head of Advanced Analytics  
Vale



HOW AUSTRALIAN GOVERNMENT IS SUPPORTING  
INVESTMENTS INTO AUTONOMOUS MINES



**HON BILL JOHNSTON MLA**  
Minister for Mines and Petroleum  
Member for Cannington  
Government of Western Australia



HOW CODELCO IS CREATING THE MOST ADVANCED  
UNDERGROUND MINES IN THE WORLD



**CRISTIÁN LÓPEZ**  
Director of Innovation  
Codelco



NEXT GENERATION AUTONOMOUS MINING AT BHP



**DANIEL JENKINS**  
Manager Integrated Planning  
BHP



MOONSHOT THINKING: MAKING SPACE MINING A REALITY  
WITH ASTEROID MINING CORPORATION BY 2025



**MITCH HUNTER-SCULLION**  
Founder and Chief  
Executive Officer  
Asteroid Mining Corporation



GLOBAL MINING GUIDELINES GROUP: IMPLEMENTATION OF  
AUTONOMOUS TECHNOLOGY ON LARGE SCALE



**MICHELLE ASH**  
Chair  
GMG Group



SUSTAINABILITY IN MINING



**THAO D.H. NGO**  
Group Executive Chairman  
First Indochina Group, Vietnam



FIRST INDOCHINA GROUP



# TESTIMONIALS OF PAST SPONSORS OF CLARIDEN GLOBAL'S DIGITAL MINES CONFERENCE

"Very good mixture of industry, companies, senior executives, digital transformation subject matter experts whom we could target as potential customers. Very happy with outcome of the event. Well organized. As Platinum sponsor received great exposure from a branding and networking perspective."

*Regional Director Western Australia & Northern Territory,  
Emerson Automation Solutions*



"The right topic, right state, right customers, good facility. Truly the right customer focused event for us, made good contacts, lots of opportunities arisen."

*Sales Manager - Process Industries, ABB Australia Pty Limited*

"Good quality of participants & networking opportunities!"

*General Manager, MST Global*



"Was a good networking event with great effort by the team to encourage contacts and engagements."

*Marketing Manager, Orica*

"An efficient event with many good leads!"

*CEO, Petra Data Science*



"The contacts made are very potential for new business for our company. The opportunity in meeting these prospects worth the investment."

*Director, Portable Analytical Solutions*

## OTHER PAST SPONSORS AND EXHIBITORS OF CLARIDEN GLOBAL'S DIGITAL MINES CONFERENCE INCLUDE:



2019

5

# PAST PARTICIPATING COMPANIES

Clariden Global's Digital Mines Conference last year has garnered Mining and Maintenance professionals from the various industries and leading companies:

AAM  
 ABB Australia  
 acQUIRE Technology Solutions  
 AECOM Australia  
 Airobotics Australia  
 Alcoa  
 Ampcontrol CSM  
 API Management  
 Aqura  
 Australian Diversified Engineering  
 Australian Vanadium  
 Batchfire Resources  
 Beijing Soly Technology  
 BHP  
 Bluefield AMS  
 Bradken  
 Byrnecut Australia  
 Calibre professional Services One  
 Cameco Australia  
 Challenge Networks  
 Citic Pacific Mining Management  
 Codelco - División El Teniente  
 Codelco Shanghai  
 Commonwealth Bank of Australia  
 Compañía Minera Teck Quebrada Blanca S.A  
 Consolidated Minerals  
 Covalent Lithium  
 CQMS Razer  
 Curtin University  
 Dacian Gold  
 Datum360  
 Debswana Diamond Company  
 Department of Mines, Industry Regulation and Safety  
 DyFlex Solutions

Dyno Nobel Asia Pacific  
 Emerson Automation Solutions  
 Epiroc  
 Ernst & Young  
 Evolution Mining  
 Fluidmesh Networks  
 Fortescue Metals Group  
 Freeport-McMoRan  
 Glencore  
 Gold Fields Australia  
 Hastings Deering  
 Hatch  
 IAMGOLD  
 Image Resources  
 Incitec Pivot  
 Independence Nova  
 INX Software  
 KPMG  
 Leica Geosystems  
 Liebherr  
 Maptek  
 Marsh  
 METS Ignited Australia  
 Micromine  
 Mineral Commodities  
 Minerals Research Institute of WA  
 Mineware  
 Mining Technicians Group - Australia  
 Mitsui Iron Ore Development  
 Miwatj Employment & Participation and YBE  
 MMG  
 MRA Engineering  
 MST Global  
 Multotec  
 Neometals

Newmont  
 Newmont Mining Company  
 NHP Electrical Engineering  
 Nokia  
 Northparkes Mines  
 OceanaGold  
 Oreology Consulting  
 Orica  
 Oz Minerals  
 Portable Analytical Solutions  
 Resolute  
 Rio Tinto  
 Roy Hill  
 Sage Media Group  
 Sanggar Sarana Baja  
 SAP  
 Scania Australia  
 Sedgman  
 South32  
 Tata Steel  
 Tata Steel Management Development Center (TMDC)  
 Teck Resources Chile Limitada  
 Telstra Mining  
 Thabo Balopi  
 The University of Queensland  
 The University of Western Australia  
 Thiess  
 Thriveni Earthmovers  
 University of Adelaide  
 VALE  
 WesTrac  
 Wipro  
 WorkPac



# HEAR WHAT ATTENDEES GOT TO SAY ABOUT CLARIDEN GLOBAL'S DIGITAL MINES CONFERENCE



**"High standard presentations!"**

*M Autonomy, Thiess*

**"The networking was the most useful part for me, though some sessions definitely got me thinking more about what**

*Technical Architect IT/OT, Fortescue Metals Group*



**"Liked the real industry examples of application of**

*General Manager, Operations Readiness, Teck Resources - QB2 Project*



**"It was enlightening to see the journey that some mining companies have gone through regarding automation!"**

*Head of Technical Services, Debswana Diamond Company*



**"Everyone was open to discuss on progress in this field and their approaches to technology implementation!"**

*Principal Digital Technologies, South 32*



**New approach with machine learning, deep learning, drone and digital twins!**

*Senior Manager, Mitsui Iron Ore*

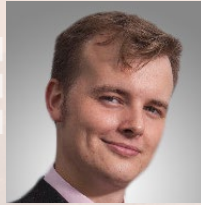


HEAR FROM KEY EXPERTS IN THE MINING INDUSTRY

WORLD-CLASS  
LINEUP OF SPEAKERS



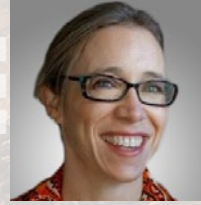
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Managing Director and CEO  
**Resolute Mining Limited**



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**DANIEL EKLUND**  
Director Technology  
**Boliden**



**MICHELLE ASH**  
Chair  
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**HELIUS GUIMARAES**  
Digital Transformation Leader  
**Alcoa**  
*(Former Chairperson of Global  
Mining Guidelines Group)*



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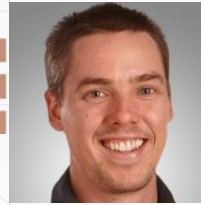
**HON BILL JOHNSTON MLA**  
Minister for Mines  
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Australia**



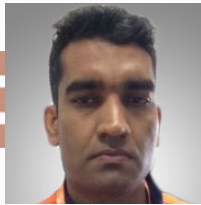
**CRISTIÁN LÓPEZ**  
Director of Innovation  
**Codelco**



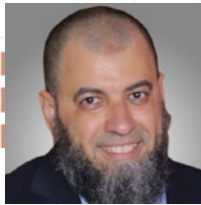
**SAMANTHA ESPLY**  
President  
**Canadian Institute of Mining,  
Metallurgy and Petroleum**  
*(Former General Manager  
(Mining Technology &  
Innovation) at Vale)*



**DANIEL JENKINS**  
Manager Integrated  
Planning  
**BHP**  
**BHP**



**RABINDRA SINGH**  
Mining Manager  
**Rio Tinto**



**HOSNY ELSAYED**  
Expert Digital  
Transformation  
**Maaden**



**THAO D.H. NGO**  
Group Executive Chairman  
**First Indochina Group,  
Vietnam**



**JOE URLI**  
President  
**Australian Certified  
UAV Operators  
Association**



**DR ANIL SUBRAMANYA**  
Research Portfolio  
Manager  
**Minerals Research  
Institute of Western  
Australia**



# CONFERENCE HIGHLIGHTS



WORLD'S FIRST FULLY AUTOMATED MINE: RESOLUTE'S \$220 MILLION GOLD MINE SYAMA



DISCOVER BOLIDEN'S FULLY AUTONOMOUS UNDERGROUND MINE



HOW VALE IS BUILDING ITS NEXT GENERATION AUTONOMOUS MINES



HOW AUTONOMOUS DRONES ARE CHANGING THE ART OF MINERAL SURVEYING AND MINING OPERATIONS



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GLOBAL MINING GUIDELINES GROUP: IMPLEMENTATION OF AUTONOMOUS TECHNOLOGY ON LARGE SCALE



SUSTAINABILITY IN MINING



DISCOVER

# WHO YOU WILL MEET AT THE CONFERENCE

## 1 APRIL 2020, EVENING: CHAMPAGNE NETWORKING SESSION

Enjoy a glass of champagne whilst networking with other like-minded individuals on topics that are of most interest to you and fellow delegates.



### Who You Will Meet:

#### SENIORITY LEVEL OF DELEGATES

**70%**

Director Levels & Above

**10%**

Head of Department

**20%**

Manager



#### Industries

- Mining companies
- IoT companies
- Drone companies
- Robotic automation companies
- Cloud platform providers
- Satellite and telecoms companies
- Consultancy firms
- Mining equipment services
- Other MET services
- Mining regulators
- Mining Supply chain companies

#### In the Roles of:

- CEO
- President
- Chairman
- Co-Founder
- Director
- CTO
- CIO
- Managing Director
- Director
- Chief Geologist
- Head, Projects
- Head, Logistics/Shipping
- Head, Automation
- Plant Superintendent
- Head, Maintenance
- Head, Safety
- Head, Operations
- Head, Data Science
- Head, IoT
- Head, Digital

HERE ARE

# 10 REASONS WHY YOU SHOULD ATTEND THE CONFERENCE

Meet leading miners, mining technology pioneers, MET providers and more on an exclusive platform for networking and knowledge sharing

Deep-dive into the latest advances on intelligent mining and how the world's leading mining companies are implementing theirs

Explore inspiring case studies such as the world's first fully autonomous underground mine and the use of digital twins and robotics to create hyper-efficient mining operations

Share in interactive roundtables on the challenges - and potential solutions - faced by companies in modernizing and optimizing their mining operations

Get up to speed on recent developments on global mining guidelines and what these mean for miners' process controls

Learn more about how innovations in autonomous haulage are transforming operations and maintenance on the logistics side of mining

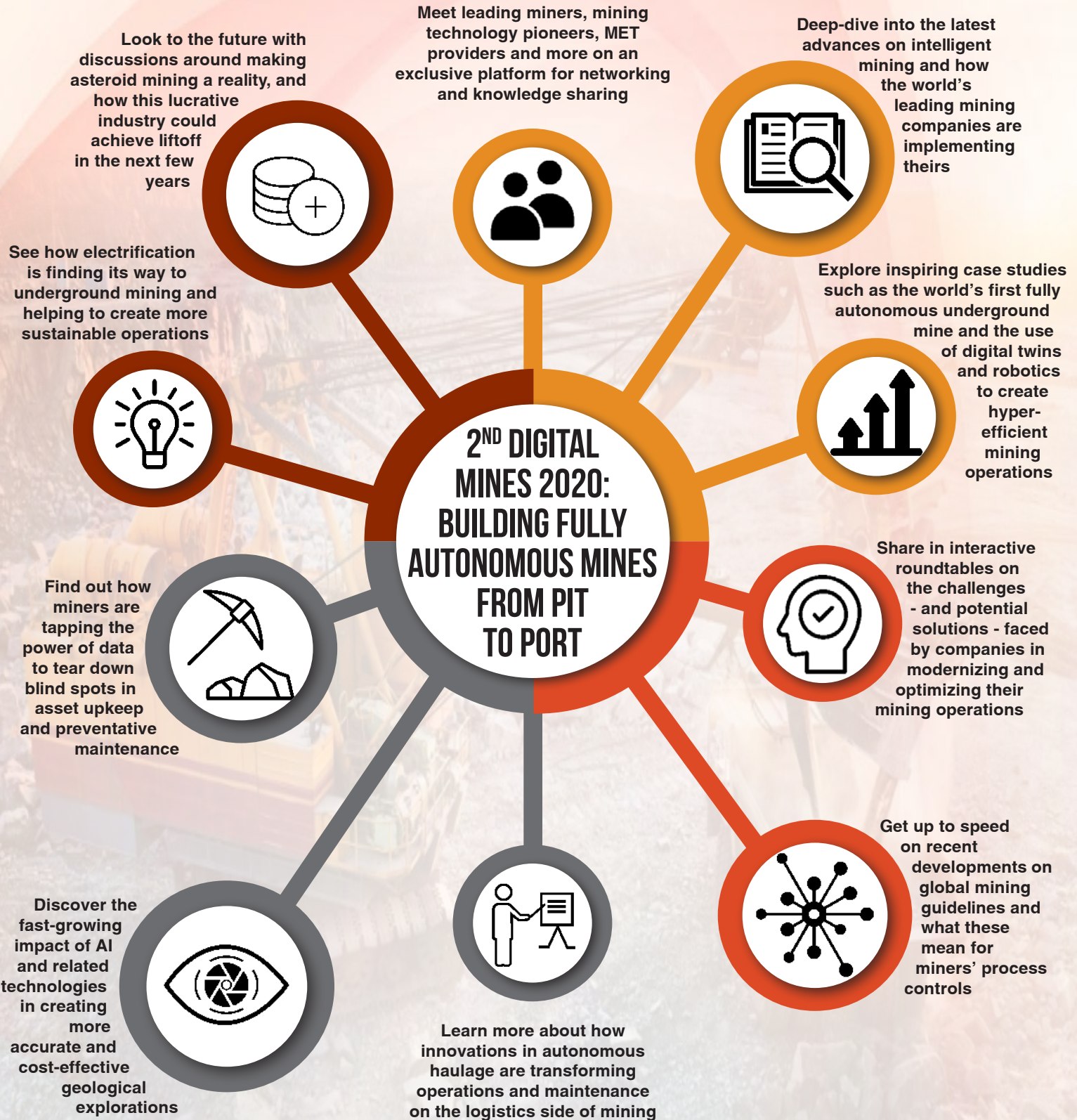
Look to the future with discussions around making asteroid mining a reality, and how this lucrative industry could achieve liftoff in the next few years

See how electrification is finding its way to underground mining and helping to create more sustainable operations

Find out how miners are tapping the power of data to tear down blind spots in asset upkeep and preventative maintenance

Discover the fast-growing impact of AI and related technologies in creating more accurate and cost-effective geological explorations

## 2<sup>ND</sup> DIGITAL MINES 2020: BUILDING FULLY AUTONOMOUS MINES FROM PIT TO PORT



MAIN CONFERENCE AGENDA

DAY 1

CREATING FULLY AUTONOMOUS MINES FROM PIT TO PORT

09:00 Welcoming Speech, Opening Remarks & Thank You  
Sponsor Speech By Chairperson



**SAMANTHA ESPLEY**  
President Elect  
Canadian Institute of Mining, Metallurgy and Petroleum



09:15 Rio Tinto's Fully Autonomous Mines  
Gamechanger: Rio Tinto's Koodaideri  
Intelligent Mine Of The Future



Rio Tinto has revealed plans to create its first "intelligent" mine, where all assets are networked together and capable of making decisions themselves "in a microsecond". The intelligent mine will be a world's first that uses fully integrated system to connect driverless trucks, trains and drills and using data analytics to optimize production, improve safety and cut downtime, using just a fraction of its Pilbara workforce.

The first intelligent mine is set to be Koodaideri, which will deliver its first tonnes of ore in 2021 with a \$2.6 billion investment and over 100 technology innovations embedded into the mine. Rio plans to build on its autonomous capabilities by making the pit-to-port process as integrated and intelligent as possible, placing decision-making with the machines themselves.

09:45 Resolute Mining In World's First Fully Automated Mines  
World's First Autonomous Underground Gold Mine:  
Resolute's \$220 Million Gold Mine Syama

The Syama underground mine is set to be the world's first purpose-built, fully automated sublevel cave gold mine. Resolute Mining is using autonomous drills as well as electrical loaders to fully automate the mine. Virtual reality will be used to map the layout of the entire mine and the company's automation work will see the commissioning of the autonomous haulage with automated rehandle loaders and haulage trucks working together to load from an ore pass and truck directly to the surface run of mine pad



**JOHN WELBORN**  
Managing Director and CEO  
Resolute Mining Limited



10:15 Morning Refreshments & Networking Session

10:30 Interactive Roundtable Discussion:

- AI In Harnessing Exploration



**ALI SOOFASTAEI**  
Artificial Intelligence (AI) Research Developer  
at the AI Centre of Excellence  
Vale



- Autonomous Mining
- Autonomous Drones



**JOE URLI**  
President  
Australian Certified UAV Operators Association



- AI And Big Data Analytics In Intelligent Mines



**MALCOLM MCRAE**  
Head of Advanced Analytics  
Vale



- Underground 5G And LTE
- Next Generation Autonomous Trucks, Loaders And Haulage Fleets
- Global Mining Guidelines Group



**HELIUS GUIMARAES**  
Digital Transformation Leader  
Alcoa



- Sustainability In Mining



**DR ANIL SUBRAMANYA**  
Research Portfolio Manager  
Minerals Research Institute of Western Australia



DISCOVERING NEW MINING DEPOSITS WITH AI AND BIG DATA

11:30 AI In Unlocking New Mine  
Discovery



**Goldcorp: Harnessing AI To Revolutionize Its Mining Exploration**

Goldcorp's mine in Red Lake has been the backbone of the gold production. However, the high grade mine is expected to be depleted by 2020. The company is now turning to AI, spatial analytics, and predictive modeling to improve geological explorations that can improve Red Lake's gold yield in a fraction of the time and cost of traditional methods. Already, its first target was a successful venture as AI has helped to find gold within a mineral deposit without having to go through costly scanning processes.

AI will now be used across every GoldCorp's minefield to analyze vast amounts of data - from drilling reports to geological survey information - to help geologists determine specific areas to explore next, reach high-value exploration targets faster, calculate geological models with more certainty, and interpret the growing volume of data as geologists drive new discoveries.

12:00 Connected And Intelligent Mines

**Why 5G Could Be The Key To Unlocking Autonomy In Deep Mines: Boliden's Fully Autonomous Mines Experience**

At one the world's first fully autonomous mines at Boliden Sweden, a 5G network now connects every aspect of the mine, including autonomous excavators, driverless trucks and automated haulage systems.

MAIN CONFERENCE AGENDA

DAY 1

5G enables operation of these autonomous vehicles, real-time monitoring of underground and outdoor premises to keep people and equipment safe, remote diagnostics and predictive maintenance, as well as asset management, control and authentication.

Traditional mines have struggled with connectivity problems, with their thick walls, ceilings and floors. These barriers significantly reduces the ability of a signal to provide a secure connection between operators and vehicles. Furthermore, as underground mines can stretch for miles in all directions, signals are harder to travel between devices. A few seconds of lost connection can result in major disruptions. This is where 5G comes in for Boliden's mine. A 5G network is currently running the entire mine site which helps to increase bandwidth, reduce latency and improve reliability. 5G has helped Boliden's mine to be one of the most efficient and safe in the world.



DANIEL EKLUND  
Director Technology  
Boliden



12:25 Lunch & Networking

AUTONOMOUS DRONES IN AUTOMATING MINING OPERATIONS

13:30 Miners Turning To Drones  
How Autonomous Drones Are Transforming Mining Operations Around The World

Autonomous drones are now used in its mining efforts to inspect powerlines, monitor stockpile inventories and inspect geological formations issues such as identifying pit walls that are either expensive, dangerous or physically impossible for humans to fit. Drones fly over a target area in a pre-programmed pattern, taking a series of photos of the ground below. The data collected is used to create 3D models in centimeter-level detail. Compared to traditional surveying techniques, drone photogrammetry significantly reduces the time taken. The use of drones enables 84% reduction in labor costs. 20 hours of traditional surveying and processing labor can be completed in an hour with drones.



JOE URLI  
President  
Australian Certified UAV Operators Association



MINES OF THE FUTURE WITH DIGITAL TWINS AND ROBOTICS

14:00 Game Changing Innovations  
Building Intelligent Mines Of The Future With Digital Twins And Robotics: Codelco - División El Teniente



CRISTIÁN LÓPEZ  
Director of Innovation  
Codelco - División El Teniente



NEXT GENERATION AUTOMATION TECHNOLOGIES

14:30 Innovations In Autonomous Haulage  
Next Generation Autonomous Trucks, Loaders And Haulage Fleets

The next generation autonomous trucks will have automated maintenance in the sense that the trucks and equipment will get themselves to the truck shop and having got there it will essentially have told the maintainers what it is there for. And all spare parts will have been digitally uploaded before it arrives, so all the parts it might well need will be there waiting to be installed.



RABINDRA SINGH  
Mining Manager  
Rio Tinto



NEXT GENERATION AUTOMATION TECHNOLOGIES

15:00 Autonomous Mining Guidelines  
Global Mining Guidelines Group: Implementation Of Autonomous Technology On Large Scale

The creation of a unified autonomous mining system is part of the industry's vision of future mining, and it has been gaining momentum in recent years. The Global Mining Guidelines Group, comprised of major miners from around the world including BHP, Codelco, Vale has recently published Guideline for the Implementation of Autonomous Systems in Mining to create a uniform standards in mining automation technology that will unify the industry by making mining companies' process controls more consistent.



MICHELLE ASH  
Chair  
GMG Group



15:30 Afternoon Refreshment & Networking

LEARNING LESSONS FROM AUTOMATION

16:00 Case Study  
Learning Lessons From Autonomous Truck Collision



SPACE MINING AND EXPLORATION

16:30 Moonshot Thinking: Making Space Mining A Reality With Asteroid Mining Corporation By 2025

For years experts have considered the possibility of mining the tens of thousands of asteroids orbiting Earth, though logistics have until now prevented this from becoming a reality. Now, a future in which we source

1 APR  
WED 13

## MAIN CONFERENCE AGENDA

### DAY 1

water, minerals and fuel from space is within our grasp, and companies such as Asteroid Mining Corporation (AMC) are already planning for the lucrative industry of space mining



**MITCH HUNTER-SCULLION**  
Founder and Chief Executive Officer  
Asteroid Mining Corporation Ltd UK



17:00 Closing Remarks by Conference Chairman

17:05 Champagne Networking



After a long day of learning, benchmarking, and planning, unwind and mingle with your peers



MAIN CONFERENCE AGENDA

DAY 2

NEXT GENERATION AUTONOMOUS MINING

09:00 Welcoming Speech, Opening Remarks & Thank You  
Sponsor Speech By Conference Producer



**SAMANTHA ESPLEY**  
President Elect  
Canadian Institute of Mining, Metallurgy and Petroleum



09:15 How Australian Government is Supporting  
Investments Into Autonomous Mines



**HON BILL JOHNSTON MLA**  
Minister for Mines and Petroleum  
Member for Cannington  
Government of Western Australia



AUTOHAUL: WORLD'S LONGEST ROBOT

09:45 Rio Tinto's Autohaul Autonomous Project  
Autohaul: Rio Tinto's Experience In  
Deploying World's Longest,  
Fully Autonomous And Heavy Haul Trains



History was made on June 14 2019. Rio Tinto completed the transition to entirely automated operation of its 1500km railway in the Pilbara region of Western Australia, becoming the first heavy-haul railway in the world to operate an automated network.

Described by Rio Tinto as the world's largest robot, AutoHaul is operating up to 50 automated and unmanned trains at any one time. Each 240-wagon, 2.4km-long consist, requires two to three locomotives, which haul 28,000 tonnes of iron-ore from the company's 16 mines to the ports of Dampier and Cape Lambert on an average 800km, 40-hour journey. This session will reveal Rio's experience in deploying with world's longest robot and the productivity it achieves from it.

10:15 Morning Refreshments & Networking Session

HOW AI AND DATA ANALYTICS ARE  
UNLOCKING GIANT LEAPS IN PRODUCTIVITY

10:30 Smart Mining With AI  
Future Smart Mines With Artificial Intelligence:  
Vale's New Artificial Intelligence Mining Center

Vale, one of the world's largest mining companies, has opened an artificial intelligence (AI) center at its Tubarao site in Vitoria, Brazil. The work related to the center is focused on several things, including optimizing the maintenance of assets such as off-road trucks, and improving the management of ore processing.



**MALCOLM MCRAE**  
Head of Advanced Analytics  
Vale



11:00 Intelligent Mines: Leveraging Big Data Analytics Capabilities Optimize Production, Operations, Maintenance And Reduce downtime



**DANIEL JENKINS**  
Manager Integrated Planning  
BHP



11:30 Autonomous Mining  
Next Generation Autonomous Mining At BHP **BHP**

BHP have deployed a number of autonomous mining components as part of their Next Generation Mining program. This includes autonomous drills and autonomous trucks in the Pilbara region. This session will bring you through the next stage of evolution in their autonomous mining strategy.

12:30 Lunch & Networking

NEXT GENERATION FULLY AUTONOMOUS DRILLING

13:30 Fully Autonomous Drilling  
How GoldCorp Realizes 40%  
Productivity Leap **GOLDCORP**

Goldcorp says it is seeing the multiple benefits of autonomous drilling at its Peñasquito gold mine in Mexico, with the company set to ramp up the use of this technology in the next few years. Goldcorp said operating hours per calendar day per drill had increased 25% since the introduction of fully-autonomous drilling, while the metres drilled per operating hour had risen 12%. This has amounted to a 40% productivity gain in metres per day, plus improved fragmentation, it added.

WHY DRONES CONTINUE  
TO MAKE MINING PRODUCTIVITY HIGHER?

14:00 Automation With Drones  
3D Mapping And Mines Inspection With Drones: How  
Autonomous Drones Are Changing The Art Of Mineral  
Surveying And Mining Operations

Automation continues to transform mining, not just boosting safety but slashing costs and raising profits. At Vale, autonomous drones have become game-changers for the company. These drones, as well as the base stations they operate from, run on AI - eliminating the need for human control. Vale deploys them on tasks ranging from the mundane - like measuring stockpiles, a historically manual and often inaccurate process - to the hazardous, like inspecting confined spaces and infrastructure. Automated drones have even been used to 3D-map mines' subsurfaces and discover previously overlooked sources of mineral wealth.

MAIN CONFERENCE AGENDA

DAY 2

The numbers speak for themselves: according to reports, autonomous drones has raised productivity at mine sites by 25% and slashed costs by 20%. These unmanned aerial vehicles' ability to gain access to constricted areas, and inspect equipment that cannot be easily reached by human inspectors, also eliminates safety risks while enabling more ground to be covered in less time



MÉDÉRIC SUON  
Chief Digital Officer  
SLN - Le Nickel



CRUSHING UNPLANNED DOWNTIME WITH AI

14:30 AI And Big Data Analytics In Maintenance  
How Teck Resources Uses Millions Of Data Points And Machine Learning To Spot Equipment Failure Before It Happens



Thanks to an innovative use of machine learning, Teck is using big data to predict the unpredictable and fix problems before they happen. Since 2011, the company have used sensors and data to monitor the health of haul trucks at our steelmaking coal operations and manage repairs and preventative maintenance. Now, with the help of artificial intelligence, they're going a step further.

Through their partnership with Google Cloud and Pythian, their are unlocking new insights from the millions of data points generated by our mobile fleets. Issues that were previously unpredictable, such as potential electric failures, are now being identified before they happen by machine learning algorithms. We are also modelling and predicting remaining life span of our trucks, determining wear and wear, identifying abnormal failures and enhancing alarm and notification systems.

15:00 *Afternoon Refreshment & Networking*

SURVEYING WITH DRONES

15:30 Field Deployment Of Autonomous Drones And Robotics In Underground Mining Inspection, Mapping And Surveying



HOSNY ELSAYED  
Expert Digital Transformation  
Maaden



SUSTAINABILITY IN MINING THROUGH AUTOMATION

16:00 Sustainability In Mining  
Vale's Roadmap To Underground Electrification



Vale is now leveraging the use of electric and battery powered vehicles at Coleman, Creighton and Copper Cliff Mines as well as commissioning a tele-remote drill and scoop at Totten Mine. And, as part of an industry-wide focus, the company is also exploring advanced analytics to allow for more responsive decision making.

16:30 Mining Sustainability With Technology  
Sustainability In Mining: How Technology Is Rapidly Improving Sustainability In Mining And Successful Mine Rehabilitations Case Studies



THAO D.H. NGO  
Group Executive Chairman  
First Indochina Group, Vietnam



17:00 Closing Remarks by Conference Chairman



POST-CONFERENCE SITE TOUR

3 APR  
FRI 16

# AUTONOMOUS MINING OPERATIONS SITE TOUR



## SITE VISIT A: AUTONOMOUS DRONES SITE TOUR: SHOWCASING HOW DRONES ARE TRANSFORMING MINING OPERATIONS, SURVEYING AND EXPLORATIONS WITH LIVE DEMONSTRATIONS

09:00 - 11:00

The use of drones in industrial inspections can lower costs by as much as 25%, and increase operational efficiency by as much as 20%. Mining giant BHP, for instance, has saved an estimated \$5 million a year by adopting unmanned aerial vehicles in its operations. Drones' ability to go where humans cannot and perform inspection, surveying and mapping tasks

with machine precision opens up a world of opportunities for miners to work safer, faster and more cost-efficiently. Learn more about the latest in mining drone technology and how it is being utilized in the field, in this tour.

## SITE VISIT B: SMART MINING WITH AI AND ANALYTICS SITE TOUR: SHOWCASE OF HOW AI AND BIG DATA ARE GIVING MINERS INTELLIGENT INSIGHTS INTO OPERATIONS, MAINTENANCE AND EXPLORATION

11:00 - 13:30

Recent studies show that mining productivity has declined by 28% over the past decade. To turn this around, the mining industry is embarking on a digital transformation, and AI and big data have become an integral part of that mix. The potential of AI in mining operations is enormous, spanning predictive maintenance that keeps equipment and infrastructure in top condition all the time to autonomous machinery to crunching vast volumes of geological data to discover new, high-value ore deposits. Join us on this exclusive tour to see some examples of AI and data in action in the pit.



## SITE VISIT C: DIGITAL TWINS IN INTELLIGENT MINES SITE TOUR: SHOWCASE HOW DIGITAL TWINS CAN BE USED TO BUILD AN INTELLIGENT AND FULLY AUTONOMOUS MINES

14:30 - 17:00

Already known as an enabler of better design and construction in building and architecture, digital twinning can shape real-time data of a mining operation into a simulated replica that allows mining operators to quickly test scenarios that could optimize production and improve site safety. One example of this technology is already in use at Rio Tinto's futuristic Koodaideri mine in the Pilbara, giving miners the ability to see things in real-time from off-site and make

safer, smarter and more productive decisions. In this tour, you will witness digital twinning in action and gain a better understanding of its role in the intelligent, autonomous mines of the future.



*Space In Each Site Visit Is Limited, Registrations Will Be Available On First Come, First Reserved Basis.*



## CAPITALIZE ON THIS CONFERENCE

## PARTNERSHIP OPPORTUNITIES

Looking for the ideal platform to elevate your professional status and strike key business partnerships?

Leverage on our limited sponsorship packages to strengthen and confirm your market position through consistent and continual branding awareness and take advantage of the plethora of opportunities with high level decision makers.

Partnering through an event sponsorship will enable you to gain:

- Unparalleled industry exposure
- Leads generation and meeting arrangements with key decision makers in the service design field
- Extraordinary brand visibility, increasing brand awareness and preference
- Long-term business partnerships with leading service design partners, customers and regulators



Please contact *Audrey Bright* at +61 3 9014 9448 or email [audrey@claridenglobal.org](mailto:audrey@claridenglobal.org) to discuss potential exhibition and sponsorship opportunities or to customize your own package.

#### Benefit as a Media Partner or Supporting Organization at 2<sup>nd</sup> Digital Mines 2020: Building Fully Autonomous Mines From Pit To Port:

- Enhance your corporate profile and visibility within your industry - Your company's logo will be emblazoned on our brochures and distributed to decision makers across the region
- Affiliation with an internationally recognized commercial event organizer

Clariden Global events are widely known and trusted throughout the world for providing best value to senior industry executives. Through partnering with selected media and supporting organizations, we are capable of delivering the highest calibre of expert knowledge and key industry insights to the target market.



If you meet the criteria mentioned above and would like to explore the opportunity to partner with us for 2<sup>nd</sup> Digital Mines 2020: Building Fully Autonomous Mines From Pit To Port, please contact *Kevin Young* at +61 3 9909 7310 or email [kevin@claridenglobal.org](mailto:kevin@claridenglobal.org).

## REGISTRATION PAGE

Please complete this section.

Booking Contact (Approving Manager) Mr/Mrs/Ms: \_\_\_\_\_  
 Job Title: \_\_\_\_\_ Department: \_\_\_\_\_  
 Telephone: \_\_\_\_\_  
 Email: \_\_\_\_\_  
 Organization: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 Postal Code: \_\_\_\_\_  
 I would like to receive more information on hotel accommodation using Clariden Global corporate rate.

Promotional Code (Optional): \_\_\_\_\_

Please register the following participant(s) for this Conference

(Please tick to select your conference packages. You may tick more than one.)

1st Participant Name (Mr/Mrs/Ms): \_\_\_\_\_

Job Title: \_\_\_\_\_ Department: \_\_\_\_\_

Telephone: \_\_\_\_\_

Email: \_\_\_\_\_ Date of Birth: \_\_\_\_\_

Conference Package Selected: \_\_\_\_\_

2nd Participant Name (Mr/Mrs/Ms): \_\_\_\_\_

Job Title: \_\_\_\_\_ Department: \_\_\_\_\_

Telephone: \_\_\_\_\_

Email: \_\_\_\_\_ Date of Birth: \_\_\_\_\_

Conference Package Selected: \_\_\_\_\_

3rd Participant Name (Mr/Mrs/Ms): \_\_\_\_\_

Job Title: \_\_\_\_\_ Department: \_\_\_\_\_

Telephone: \_\_\_\_\_

Email: \_\_\_\_\_ Date of Birth: \_\_\_\_\_

Conference Package Selected: \_\_\_\_\_

4th Participant Name (Mr/Mrs/Ms): \_\_\_\_\_

Job Title: \_\_\_\_\_ Department: \_\_\_\_\_

Telephone: \_\_\_\_\_

Email: \_\_\_\_\_ Date of Birth: \_\_\_\_\_

Conference Package Selected: \_\_\_\_\_

### CONFERENCE FEES

Conference Packages	Super Early Bird Fee (If payments and registrations are received by 30 Jan 2020)	Early Bird Fee (If payments and registrations are received by 24 Feb 2020)	Final Early Bird Fee (If payments and registrations are received by 23 Mar 2020)	Regular Fee
<b>INDUSTRY PROFESSIONALS</b>				
A: 2-day Conference (Most Popular)	AUD 1,995	AUD 2,195	AUD 2,295	AUD 2,395
B: 2-day Conference + Site Tour (Most Value)	AUD 2,595	AUD 2,795	AUD 2,895	AUD 2,995

**PLEASE NOTE:** The conference fee includes lunch, refreshments and conference documentation. Payments are required with registration and must be received prior to the conference to guarantee your place.

### GROUP DISCOUNTS

**Register with your Colleagues Today to Enjoy Group Discount\*:**  
 Group discount of 10% for the 2nd participant from the same organization.  
 For limited time only by 23 March 2020, register 3 participants and the 4th participant will receive a **complimentary** seat.  
 For 5 or more registrations, please contact **Kevin Young** at [kevin@claridenglobal.org](mailto:kevin@claridenglobal.org).  
 Group Discount will only be applicable to the package of the lowest value.  
 \*Only 1 discount scheme will apply. Discount will compound on top of your early bird discount! This offer is valid for a limited time only, till 23 March 2020.

### 4 WAYS TO REGISTER

-  Email: [admissions@claridenglobal.com](mailto:admissions@claridenglobal.com)
-  Fax: +61 3 9909 7788
-  Call: +61 3 9909 7310
-  Website: [www.claridenglobal.com](http://www.claridenglobal.com)

### PAYMENT METHODS

#### BY CHEQUE / BANK DRAFT :

Made payable to CLARIDEN GLOBAL INTERNATIONAL LIMITED and mail to: 3 International Business Park, #04-29, Nordic European Centre, Singapore 609927.

#### BY TELEGRAPHIC TRANSFER TO:

Bank Name: **Standard Chartered Bank**  
 Bank Code: **7144**  
 Bank Branch Code: **001**  
 Bank Address: **6 Battery Road, #01-01 Singapore 049909**  
 Bank Account No: **0107775042**  
 Bank Account name: **CLARIDEN GLOBAL INTERNATIONAL LIMITED**  
 SWIFT Code: **SCBLSG22**

Please note that all bank charges are to be borne by participants. Please ensure Clariden Global International Limited receives the full invoiced amount.

**Note:** Please include invoice number on all payment types and your company's name in your payment instructions for our reference.

#### CREDIT CARD:

To make payment by credit card, please call our client services hotline at +61 3 9909 7310.

### CONFERENCE VENUE AND ACCOMMODATION INFORMATION

#### Pan Pacific Perth

1 - 3 April 2020

Address: 207 Adelaide Terrace, Perth WA 6000, Australia

Phone: +61 8 9224 7777

Website: <https://www.panpacific.com/en/hotels-and-resorts/pp-perth.html>

### HOW TO REGISTER AND PAY

An invoice and registration confirmation will be sent within 7 days, please contact us if you have not heard from us within 7 days. Payment can be made by credit card, by bank transfer or by cheque made payable to "CLARIDEN GLOBAL INTERNATIONAL LIMITED".

**ALL PAYMENTS MUST BE RECEIVED IN ADVANCE OF THE EVENT.**

### ACCOMMODATION

Accommodation is not included in the program fee but you will be entitled to use our corporate rate for your accommodation. Information will be sent along with your registration confirmation.

### CANCELLATIONS AND SUBSTITUTIONS

Once we have received your booking, the place(s) are confirmed. No refunds will be made for any cancellations, however, program credits of equivalent value only applicable for Clariden Global events will be provided. Credits can only be redeemed for 1 program and is valid for only one (1) year from date of issue.

Substitution with a qualified candidate is allowed by providing at least 5 working days of advance notice to Clariden Global. One time substitution is allowed with no charges. Subsequent substitutions will be charged 10% admin fee.

### ALL CANCELLATIONS MUST BE RECEIVED IN WRITTEN FORM

**PLEASE NOTE:** CLARIDEN GLOBAL INTERNATIONAL LIMITED reserves the right to change the content and timing of the programme, the speakers and the date and venue due to reasons beyond their control. If in the unlikely event that the course is cancelled, CLARIDEN GLOBAL INTERNATIONAL LIMITED will refund the full amount and disclaim any further liability.

**ENQUIRIES:** If you have any queries about registration or payment please do not hesitate to contact our client services department on +61 3 9909 7310.

**PRIVATE DISCLOSURE STATEMENT:** Any information provided by you in relation to this event is being collected by CLARIDEN GLOBAL INTERNATIONAL LIMITED and will be held in the strictest confidence. It will be added to our database for the primary purpose of providing you with information about future events and services.

Visit us at [www.claridenglobal.com](http://www.claridenglobal.com) for upcoming events

### FOR OFFICIAL USE

FEE RECEIVED

REFERENCE L20011/CM/LF