Secure Supply Chains Start with Us

American Exploration & Mining Association’s 128th Annual Meeting, Exposition & Short Courses
December 4 - 9, 2022
Nugget Casino Resort
Sparks, Nevada, USA

2022
Final Program
American Exploration & Mining Association’s
2022 Annual Meeting Sponsors

$10,000 & up
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Florin Analytical Services
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American Exploration & Mining Association’s 2022 Annual Meeting Sponsors... (continued)

$1,000 - $2,499

Barr Engineering Co.
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ACZ Laboratories, Inc.
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** Indicates we have applied for CLE Credits from ID, CO, NV & UT
2022 Keynote Speakers

Wednesday Keynote Speaker

Chris Welton
*Rio Tinto Exploration Director for the Americas*

**Exploration, the Lifeblood of a Sustainable Mining Industry**

Chris Welton is the Exploration Director for the Rio Tinto Explorations Americas region based in Salt Lake City. Chris is responsible for delivery of growth options for Rio Tinto through early stage greenfields exploration, brownfields exploration, advanced project execution and support for project acquisition throughout North and South America. Chris is a geologist and has been with Rio Tinto for 26 years, working in multiple roles in both exploration and Rio Tinto’s operations across the globe. This included roles as the Exploration Executive based in London and the CEO of the Chinalco Rio Tinto Exploration JV in Beijing China.

Thursday Keynote Speaker

Alex Jacquez
*Senior Policy Advisor*
*White House National Economic Council*

**Biden-Harris Administration Strategy to Secure Reliable, Sustainable Critical Minerals Supply Chains**

Alex Jacquez serves as a Senior Policy Advisor for the National Economic Council at the White House. Prior to joining the Biden-Harris Administration, he served as Senior Policy Advisor for labor and economic policy on the Senate Budget Committee under Chairman Bernie Sanders (I-VT). He has previously served in various policy and engagement roles for Senate Democratic leadership, the Obama-Biden White House, the U.S. Department of Agriculture, and federal and state campaigns. He graduated from Lehigh University where he majored in political science and lettered in baseball.

Keynote Luncheons are on the 1st floor of the Casino in the Celebrity Showroom

Tickets $65.00
2022 Program Chairman

Todd Glindeman
Mining & Waste Market Sector Director
Brown and Caldwell
Boise, ID
Glinderman@brwncald.com

Todd Glindeman is the Mining Market Sector Director for Brown and Caldwell (BC) and is based in Boise, Idaho. He has been with BC his entire 21-year career. Todd has been leading and managing large-scale mining compliance and permitting projects in Idaho for more than a decade. He works with mining industry partners to develop plans for efficiently addressing regulatory challenges and negotiating the permitting processes. He has more than 20 years of experience in client service, program and project management, and environmental services.

Todd graduated from the University of Idaho with BS and MS degrees in Environmental Science in 1999 and 2006, respectively. He is an active member of the Idaho Mining Association and has participated as a conference planning committee member for the Idaho Mining Conference since its inception in 2018. Todd has also participated in board positions for the Boise Section SME, including serving as the 2018–19 Chair.

2022 Program Co-Chairman

Chris Guedes
Permitting Manager
Itafos Conda LLC
Soda Springs, ID
cguedes@itafos.com

Chris Guedes began NEPA permitting full-time in 2013. Prior to working in the NEPA field, Chris worked as a civil engineer as well as in the medical private practice industry in management and consulting. Chris holds a BA in Business Management, an MBA, and a BS in Civil Engineering.

Student & Early Career Professionals Reception Sponsored by:
SRK Consulting (US), Inc., Perpetua Resources & Teck American Incorporated

Student & Early Career Professionals Lunch Sponsored by,
Teck American Incorporated.
Ron Rimelman worked as a consultant to NOVAGOLD for 18 months prior to joining the Company in 2011. He is Vice President, Environment, Health, Safety & Sustainability. With nearly 30 years of environmental experience, Ron has managed environmental impact assessments and permitting activities for mines around the world, with a focus in Alaska and other northern climates. His most recent position was Vice President Environmental Services for Tetra Tech Inc., where he coordinated the natural resources group and took the lead on a range of projects, including preparing environmental impact statements for the Kensington and Red Dog Mines in Alaska. Ron also has extensive experience with mine permitting and water resource analysis, as well as financial and personnel management.
Wednesday Networking Highlights

7:00 - 9:15 am  **Burrito Breakfast ~ AEMA Registration Area**  
Best breakfast in town. Located in the student poster session area, hosted by Kappes Cassiday & Associates and Florin Analytical Services

9:35 - 10:20 am  **Morning Coffee Break ~ Exhibit Hall**  
Great time to network and visit with the exhibitors.

noon - 1:30 pm  **Wednesday Keynote Luncheon $65 ~ 1st Fl. Celebrity Showroom**  
Keynote Speaker - **Chris Welton, Rio Tinto Exploration Director for the Americas**

noon - 1:30 pm  **Exhibit Hall A’ la carte Lunch Station ~ Exhibit Hall**  
Grab a quick lunch and walk around the exhibits. This replaces the former sandwich lunch. No tickets. You pay at the station.

3:35 - 4:20 pm  **Afternoon Coffee Break ~ Exhibit Hall**  
Great time to network and visit with the exhibitors.

5:30 - 6:30 pm  **Welcoming Reception ~ Exhibit Hall**

6:30 - 7:30  **Students & Early Career Professionals Reception ~ Redwood 6**

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**Students & Early Career Professionals Reception**  
Wednesday 6:30- 7:30 ~ 2nd Floor ~ Redwood 6

Sponsored by:  
Teck American Incorporated  
SRK Consulting (U.S.) Inc.  
Perpetua Resources
Thursday Networking Highlights

7:00 - 9:15 am  **Burrito Breakfast  ~ AEMA Registration Area**
Best breakfast in town. Located in the student poster session area, hosted by Kappes Cassiday & Associates and Florin Analytical Services

9:35 - 10:20 am  **Morning Coffee Break  ~ Exhibit Hall**
Great time to network and visit with the exhibitors.

noon - 1:30 pm  **Thursday Keynote Luncheon $65 ~ 1st Fl. Celebrity Showroom**
Keynote Speaker - **Alex Jacquez, Senior Policy Advisor, White House National Economic Council**

noon - 1:30 pm  **Students & Early Career Professionals Buffet Lunch $55 ~ 1st Floor - Orozko**
Registered students are comped
This luncheon is an event that gives students live access to early career professionals in an informal setting. Our format opens with a casual lunch and brief introductory statements. Then, individuals from a range of professional disciplines circulate among the students in small group settings to answer questions and offer insights on how to make a successful transition from academia to the professional world.

noon - 1:30 pm  **Exhibit Hall A’ la carte Lunch Station  ~ Exhibit Hall**
Grab a quick lunch and walk around the exhibits. This replaces the former sandwich lunch. No tickets. You pay at the station.

3:35 - 4:20 pm  **Afternoon Coffee Break  ~ Exhibit Hall**
Great time to network and visit with the exhibitors.

5:30 - 6:30 pm  **Happy Hour Reception  ~ Exhibit Hall**

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**Students & Early Career Professionals Luncheon**
Thursday ~ 1st Floor - Orozko ~ Noon - 1:30

Sponsored by
Teck American Incorporated
SCHEDULE OF EVENTS

SUNDAY DECEMBER 4
7:00 - 8:00  Sunday Short Course Badge Pickup
8:00 - 5:00  3-Day Short Courses
3:00 - 5:00  Registration & Packet Pick Up

MONDAY DECEMBER 5
7:00 - 5:00  Registration & Packet Pick Up
8:00 - 5:00  Short Courses

TUESDAY DECEMBER 6
7:00 - 5:00  Registration & Packet Pick Up
8:00 - 5:00  Short Courses
2:30 - 5:00  AEMA Board Meeting - 3rd Fl. Southern Pacific
6:00 - 8:00  Hosted Kick-Off and Awards Reception - 5th Fl - Chalet Terrace

WEDNESDAY DECEMBER 7
7:00 - 5:30  Registration & Packet Pick Up
7:00 - 9:15  Burrito Breakfast - *hosted by Kappes Cassiday & Florin Analytical Services*
8:00 - 11:30  Morning Technical Sessions
9:00 - 6:30  Exhibit Hall & Student Posters
9:35 - 10:20  Exhibit Hall Coffee Break (All sessions break)
Noon - 1:30  Wednesday Keynote Speaker Luncheon - 1st Fl. Celebrity Showroom
Exhibit Hall A’ la carte Lunch Station
2:00 - 5:30  Afternoon Technical Sessions
3:35 - 4:20  Exhibit Hall Coffee Break (All sessions break)
5:30 - 6:30  Welcoming Reception in the Exhibit Hall
6:30 - 7:30  Students & Early Career Professionals Reception

THURSDAY DECEMBER 8
7:00 - 5:30  Registration & Packet Pick Up
7:00 - 9:15  Burrito Breakfast - *hosted by Kappes Cassiday & Florin Analytical Services*
8:00 - 11:30  Morning Technical Sessions
9:00 - 6:30  Exhibit Hall & Student Posters
9:35 - 10:20  Exhibit Hall Coffee Break (All sessions break)
Noon - 1:30  Thursday Keynote Speaker Luncheon - 1st Fl. Celebrity Showroom
Students & Early Career Professionals Luncheon - 1st Fl. Orozko ~
*Registered students are comped*
Exhibit Hall A’ la carte Lunch Station
2:00 - 5:30  Afternoon Technical Sessions
SCHEDULE OF EVENTS... (continued)

3:35 - 4:20  Exhibit Hall Coffee Break (All sessions break)
5:30 - 6:30  Happy Hour Reception in the Exhibit Hall

FRIDAY DECEMBER 9

7:00 - 11:00  Registration & Packet Pick Up
7:00 - 9:15   Burrito Breakfast - hosted by Kappes Cassiday & Florin Analytical Services
8:00 - 11:00  Morning Technical Sessions
8:00 - 11:00  Exhibit Hall & Student Posters
9:35 - 10:20  Exhibit Hall Coffee Break (All sessions break)
11:00 - 5:00  Exhibit Tear Down

EXHIBIT HALL HOURS & ACTIVITIES

TUESDAY DECEMBER 6 ~ 8:00 am- 5:00 pm
• Exhibitor Set up

WEDNESDAY DECEMBER 7 ~ 9:00 am - 6:30 pm
• Exhibits Open ~ 9:00 am
• Morning Coffee Break ~ 9:35 - 10:20
• Exhibit Hall A’ La Carte Lunch Station ~
  Noon - 1:30 pm
• Afternoon Coffee Break ~ 3:35 - 4:20
• Welcoming Reception ~ 5:30 pm - 6:30 pm

THURSDAY DECEMBER 8 ~ 9:00 am - 6:30 pm
• Exhibits Open ~ 9:00 am
• Morning Coffee Break ~ 9:35 - 10:20
• Exhibit Hall A’ La Carte Lunch Station ~
  Noon - 1:30 pm
• Afternoon Coffee Break ~ 3:35 - 4:20
• Happy Hour Reception ~ 5:30 pm - 6:30 pm

FRIDAY DECEMBER 9 ~ 9:00 am - 11:00 am
• Exhibits Open ~ 9:00 am - 11:00 am
• Morning Coffee Break ~ 9:35 - 10:20
• TEAR DOWN - 11:00 am - 5:00 pm
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<td>SUNDAY</td>
<td>Using SRCE Version 2.0 New &amp; Updated Training</td>
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<td>Jeff Parshley</td>
<td>Jeff Parshley SRK (U.S.), Inc.</td>
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<td>Using SRCE Version 2.0 New &amp; Updated Training</td>
<td>Understanding the SEC's New Mining Disclosure Rule S-K 1300</td>
<td>Mastering EXCEL for Earth Science Professionals</td>
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<td>Jeff Parshley</td>
<td>Greg Gosson Wood &amp; Stella Searston Mine Technical Services</td>
<td>Javad Sattarvand University of Nevada, Reno</td>
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<td>Cascade 1</td>
<td>Cascade 3 CLE Credits Pending</td>
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<td>Understanding the SEC's New Mining Disclosure Rule S-K 1300</td>
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<td>Redwood 6 CLE Credits Pending</td>
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Tuesday Evening - Hosted Kick-Off and Awards Reception - Chalet Terrace 6:00 - 8:00

We have received approval from Nevada and Utah for CLE Credits. Colorado and Idaho are still pending.

The short courses and technical sessions that qualify for these credits have “CLE Credits Pending” on the schedules and also on the description pages.
| DEC 7 | WED AM | 8:00 - 11:30 | State & Province Reports I | John Muntane NY Bureau Miners & Geology | Cascade 2 |
| DEC 7 | WED PM | 2:00 - 5:30 | State & Province Reports II | John Muntane NY Bureau Miners & Geology | Cascade 2 |
| NOON | - 1:30 | | | | |
| DEC 8 | THUR AM | 8:00 - 11:30 | Domestic Critical Minerals Development | Chris Dail Perpetue Resources & Peter Vikre U.S.G.S. | Cascade 1 |
| DEC 8 | THUR PM | 2:00 - 5:30 | Large Left Lateral Leaps to Geologic | Curtis Johnson Bronco Creek Exploration | Cascade 2 |
| NOON | - 1:30 | | | | |
| DEC 9 | FRI AM | 8:00 - 11:30 | The Curt Everson Great Basin Exploration Session | Chad Peters Ridgeline Minerals & Bob Felder Orogen Royalties | Cascade 2 |
| NOON | - 1:30 | | | | |
| DEC 7 | WED AM | 8:00 - 11:30 | MINERAL DEPOSITS | GEOLOGY & EXPLORATION | 5th Fl Chalet Terrace |
| DEC 7 | WED AM | 8:00 - 11:30 | BUSINESS & FINANCE | 5th Fl Chalet Terrace | |
| DEC 7 | WED AM | 8:00 - 11:30 | OPERATIONS | 5th Fl Chalet Terrace | |
| DEC 7 | WED AM | 8:00 - 11:30 | ENVIRONMENTAL | 5th Fl Chalet Terrace | |
| DEC 7 | WED AM | 8:00 - 11:30 | LEGISLATIVE & PUBLIC AFFAIRS | 5th Fl Chalet Terrace | |
| DEC 7 | WED AM | 8:00 - 11:30 | EXHIBIT HALL | 5th Fl Chalet Terrace | |
| NOON | - 1:30 | | | | |
| DEC 8 | THUR AM | 8:00 - 11:30 | Students & Early Career Professionals Session | Dale Kern Perpetue Resources & Seno Cicek Nevada Gold | Cascade 4 |
| DEC 8 | THUR AM | 8:00 - 11:30 | NEPA Reform & Permitting for Strategic Minerals | Ron T. Parratt Jr. Newmont & Mike Hardy Lumos & Associates | Cascade 5 |
| DEC 8 | THUR AM | 8:00 - 11:30 | Mining Hydrology | Ron T. Parratt Jr. Newmont & Mike Hardy Lumos & Associates | Cascade 5 |
| DEC 8 | THUR AM | 8:00 - 11:30 | Large Left Lateral Leaps for Environmental Professionals - Mining & the Green Economy | Scott Effner Alloys Group & Dan Stanaway Brown and Caldwell | Cascade 4 |
| DEC 8 | THUR AM | 8:00 - 11:30 | Securing Mining's Future with Innovative HR Strategies | Lindsay Schultz MRC Mining Recruiting | Cascade 5 |
| DEC 8 | THUR AM | 8:00 - 11:30 | Site Characterization - Identifying, Quantifying, and Evaluating Uncertainty | Scott Effner Alloys Group & Dan Stanaway Brown and Caldwell | Cascade 5 |
| DEC 8 | THUR AM | 8:00 - 11:30 | Large Left Lateral Leaps for Environmental Professionals - Mining & the Green Economy | Shawn Calendine hydroGEOPHYSICS | Cascade 4 |
| DEC 8 | THUR AM | 8:00 - 11:30 | Guidelines For Reporting Exploration Results, Mineral Resources, And Reserves | Abani Samal GeoGlobal LLC | Cascade 5 |
| DEC 8 | THUR AM | 8:00 - 11:30 | Artificial Intelligence & Data Analytics Applications in Mining Operations | Ali Soofastaei Vale-Australia & Javad Sattarvand University of Nevada Reno | Cascade 4 |
| DEC 8 | THUR AM | 8:00 - 11:30 | ESG and Responsible Mining | Jay Gear & Korre Hickel Coeur Mining, Inc. | Cascade 3 |
| DEC 8 | THUR AM | 8:00 - 11:30 | Site Characterization - Identifying, Quantifying, and Evaluating Uncertainty | Scott Effner Alloys Group & Dan Stanaway Brown and Caldwell | Cascade 5 |
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| NOON | - 1:30 | | | | |
2022 Short Course Program

THREE DAY SHORT COURSES | SUNDAY DECEMBER 4, MONDAY DECEMBER 5 & TUESDAY DECEMBER 6

USING SRCE VERSION 2.0 – NEW AND UPDATED TRAINING

Cascade 1

Instructor: Jeff Parshley, P.G., C.P.G., Corporate Consultant (Mine Closure), SRK Consulting (U.S.), Inc., Reno, NV

Course Description

The Standardized Reclamation Cost Estimator (SRCE) is a public domain Microsoft Excel-based tool that has been used in Nevada for more than 10 years to calculate mine closure costs for financial assurance. The SRCE uses straightforward user inputs to create a first-principles estimate of closure costs. In addition to the Nevada-specific version, another version of SRCE is available for use in other states and internationally.

Over the last two years the non-Nevada version has been significantly upgraded with numerous new features and improved performance to create SRCE 2.0. The new features greatly expand the capabilities and functionality of the model - so much that we have completely re-vamped our standard SRCE training short course.

Because so many of the new features focus on things like detailed cost scheduling, filtering, and tracking costs by category, we have completely updated our curriculum to focus on strategizing the model setup based on site or company specific needs, and the type and intent of the cost estimate.

There will still be a heavy emphasis on hands-on training, but after an initial few simple exercises, we will focus on closure cost types, how to set up a closure chart of accounts, developing useful filters, and effective scheduling for project-specific needs.

Attendees will need to bring a laptop computer and engineering scale ruler for the hands-on exercises. If users wish to bring an existing SRCE model from a previous version, we will show them the process of importing that model into SRCE Version 2.0.

About the Instructor:

Jeff Parshley is the Corporate Consultant (Mine Closure) of SRK Consulting and an experienced mine closure strategist and regulatory specialist. He has extensive, global experience working with industry and governmental organizations contributing to the development of several regulatory guidelines for mine closure and closure cost estimating and development of closure related corporate standards, policies, and guidance documents. He has worked with legal and policy aspects of mining projects since his early career and regularly works on World Bank and IFC compliance projects. A graduate of Dartmouth College, Jeff has nearly 40 years of experience, including more than 30 years in mine closure.

Monday Short Course Breaks are Sponsored by:

Fordia, Perpetua Resources & TonaTec Exploration
UNDERSTANDING THE SEC’S NEW MINING DISCLOSURE RULE: S-K 1300  
*Cascade 3*

Instructors: **Greg Gosson**, Technical Director, Geology & Compliance, Wood, Vancouver, Canada and **Stella Searston**, Consulting Geologist, Mining Technical Services, Denver, Colorado

**Course Description**

The new SEC rule rescinds Industry Guide 7 and consolidates all mineral property disclosure requirements into Regulation S-K 1300. The new rule modernizes disclosure requirements since IG 7 dates back to 1982, and provides investors with a more comprehensive understanding of registrant’s mineral properties. The new rule more closely aligns the SEC’s disclosure requirements and policies for mineral properties with current industry and global regulatory practices and standards. S-K 1300 became effective February 25, 2019 and mining registrants can voluntarily immediately comply with the new rule. All mining registrants with the SEC must comply from January 1st, 2021 onward.

This short course will compare Regulation S-K 1300 disclosure requirements to the current SEC Industry Guide 7 and will cover the following topics on Regulation S-K 1300:

- Those companies that must comply and those that are exempt
- The three defined stages of mining issuers, and of mineral properties
- Requirements for “summary disclosure” and for “individual property disclosure”
- Determining material mineral properties
- Exploration results, mineral resource and mineral reserve disclosure requirements
- “Initial assessment” reports and their required content
- “Feasibility study” and “pre-feasibility study” reports and their required parameters
- “Technical report summary” report triggers and their required content
- Qualified Person definition, registrant’s requirements and QP responsibilities
- Commodity price allowances and marketing study requirements
- Reconciliation disclosure
- Internal controls disclosure requirements
- Voluntary disclosure allowances

Course participants will be provided with a course completion certificate.

**About the Instructors:**

**Stella Searston** has more than 30 years of worldwide experience in mining consulting, mineral exploration, and regulatory compliance issues, with a focus on Australasia, the Pacific, Africa, and North and South America. Stella’s specialties include project and property evaluation; resource development; feasibility study and project management including data room setup; commodity and company reviews; technical reviews, audits, and due diligence; and Technical Reports, Technical Report Summaries and Competent Person’s Reports under NI 43 101, SK 1300, JORC, and SAMREC.
Greg Gosson has 36 plus years in the mining industry; five years as Chief Mining Advisor of the BC Securities Commission; Led the project to revise NI 43-101 in 2005; Involved in drafting legislation on Civil Liability under BC Securities Act, and NI 51-102 Continuous Disclosure Obligations; Former chair, current member of the Mining Technical Advisory and Monitoring Committee on NI 43-101: industry advisory group to the Canadian securities regulators; Member of the PDAC Securities Committee; Member of the CIM Committee on Mineral Resources and Reserves (and Best Practices); Member of the CIMCSA Working Committee on NI 43-101; 12 years as Technical Director, Geology & Compliance with Wood, formerly AMEC/Amec Foster Wheeler.

NEPA TRAINING

Cascade 4

Instructor: Matt Petersen, NEPA Technical Director, SWCA Environmental Consultants, Denver, CO

Course Description:
SWCA is offering a two-day short course on implementing streamlining techniques to deliver defensible NEPA decisions on complex mining projects within current CEQ-mandated timeframes. This class will provide practical instruction on planning pre-work specifically to streamline the NEPA process, early and efficient alternatives development, and collaborative impacts analysis planning to minimize re-work. The course will cover the following:

- Overview of NEPA as a planning tool to expedite mine plan review
- Tips for effective pre-work – Early integration of mine plan development and data gathering work plans with pending NEPA requirements.
- Alternative development – issues-driven alternatives development and defensible elimination of alternatives from detailed analysis
- Systematic planning impacts analysis – Issue identification and planning for concise issues-based analysis
- Flexible NEPA for a changing administration – writing NEPA analysis to conform with existing CEQ regulations while addressing Biden administration EOs and updates to DOI priorities, including climate and environmental justice

About the Instructor:

Matt Petersen is the NEPA Technical Director for SWCA Environmental Consultants. He has 28 years of experience as a NEPA practitioner and has provided National Environmental Policy Act (NEPA) management or oversight for over 40 large-scale EIS’s, including projects in Nevada, Arizona, Alaska, Colorado, Idaho, New Hampshire, Utah, Vermont, Texas, New Mexico, California, and Wyoming. His NEPA experience includes work with most major federal agencies and encompasses mining, resource management plans, ski areas expansions, fire management plans, oil and gas, pipelines, transmission lines, wind farms, airports, and power plants. He has taught applied NEPA seminars and classes for the Bureau of Land Management (BLM), USDA Forest Service (USFS), Bureau of Reclamation (BOR), U.S. Department of Transportation Maritime Administration, and the Federal Aviation Administration (FAA).
MASTERING EXCEL FOR EARTH SCIENCE PROFESSIONALS
Cascade 5

Instructor: Dr. Ing Javad Sattarvand, Associate Professor, Kinross Gold Term Position, Mackay School of Earth Sciences & Engineering, Department of Mining and Metallurgical Engineering, Reno, NV

Requirement: Students need to have their laptop with MS Excel installed on it. Students need to have a basic knowledge of using spreadsheets.

Learning Outcomes:
Upon completion of this short course you will become familiar with the sources of the data in earth science and engineering and you will be able to use Excel for:
   a. Importing and preparing the input data
   b. Use the power of Excel Formulas
   c. Advanced visualiziation of the data
   d. Analysis of data using pivot tables and power query

Topics of the Course

A. Data types in exploration and mining operations

B. Working with Data
   a) Data preparation
   b) Data sorting
   c) Data filtering
   d) Name ranges and excel tables
   e) Import, export, and validation of data
   f) Auditing worksheet formulas
   g) What-if analysis

C. Formulas and functions in Excel
   a) Lookup and reference functions
   b) Power functions
   c) Statistical functions
   d) Math functions
   e) Data functions
   f) Reference functions
   g) Text functions
   h) Information functions

D. Data Visualization
   1. Charts and Graphs
   2. Automation
   3. Animation
   4. Dynamic Dashboards

E. Mastering Pivot Tables
   a. Pivot table formatting
   b. Sorting, filtering and grouping for pivot tables
   c. Pivot charts and printing
   d. Manipulating pivot tables
F. Power Query
   a. Connecting to the data source
   b. Pivoting and unpivoting
   c. Grouping
   d. Appending queries
   e. Merging data with joins
   f. Using variables

About the Instructor:

**Dr. Javad Sattarvand, Ph.D.**, is an associate professor at the Department of Mining and Metallurgical Engineering, at the University of Nevada, Reno since 2015. Dr. Sattarvand received his Ph.D. in Mining Engineering from the University of Rheinisch-Westfälische Technische Hochschule Aachen – Germany in 2009. With 17 years of academic appointments as a lecturer, Assistant Professor and Associate Professor in the USA, Germany, Netherlands, and Iran and supervising 34 Masters and 3 Ph.D. students, he is the teacher for mining automation and mining robotics courses at the University of Nevada, Reno. Dr. Sattarvand has published 26 journal and over 70 conference papers and has received over three million dollars of federal grants, mostly from NIOSH. He has been also the recipient of the prestigious SME’s career development grant ($300K). Dr. Sattarvand’s industrial expertise is in mine planning, optimization algorithms, and programming for different mining applications, mine monitoring, and mine control systems. He has founded two start-up companies and his cooperation with major global consulting companies resulted in more than 20 industrial projects and the commercialization of several software and hardware products for mining automation.

**MSHA ANNUAL SURFACE REFRESHER TRAINING - (8 HR)**

Cost: No charge for the course, $25.00 for lunch

Instructor: **Tim Pruitt**, Pruitt Safety

*Cascade 2*  
Sponsored by Legarza Exploration

8 Hour class room training

- Prerequisite - Attendees must have already attended the MSHA 24 hour (Surface) new miner training, and/or be able to show that their last 8hr refresher is not more than three years old. They need to provide me with a copy of their latest 5000-23 form.

**About the instructor**

**Tim Pruitt** is the owner of Pruitt Safety LLC. He has worked in the mine safety business for over 30 years, most of which was working directly for mining companies. Tim worked a number of years for a large drilling company and for the last 4 years as a Safety Consultant. Most of my client’s are contract companies working with the mines, mine exploration, and drilling industries.

**Tuesday Short Course Breaks are Sponsored by:**

Perpetua Resources and TonaTec
FUNDAMENTALS OF MINERAL & METALLURGICAL PROCESSING

Instructors: Eur Ing Dr. Corby G. Anderson QP CENG FIMMM FICHEME, Harrison Western Professor, Kroll Institute for Extractive Metallurgy, George S. Ansell Department of Metallurgical and Materials Engineering, Colorado School of Mines, Golden, CO and Dr. Courtney Young, QP, Lewis S. Prater Distinguished Professor, Metallurgical & Materials Engineering, Montana Tech, Butte, MT

Course Description
This short course is open to anyone wanting to learn about mineral processing and extractive metallurgy operations. It is particularly good as a refresher or introductory course. In this regard, the course begins with simple concepts such as sampling, analysis (mineralogical, chemical and size), material balances and smelter schedules. It then introduces attendees to processing methods and equipment, particularly those utilized in the mining industry (but also the recycling industry as well). Various unit operations are reviewed including comminution (crushing, grinding, screening and classification), mineral separations (flotation, magnetic, gravity and electrostatic), and metal production and purification (hydrometallurgy, pyrometallurgy and electrometallurgy) as well as environmental management (dewatering, tailings disposal, and waste treatment for water, dust and air). Flowsheets of typical operations are reviewed throughout with implications on flowsheet development.

Attendees will need their laptops.

About the instructors:

Dr. Corby G. Anderson is a licensed professional engineer with over 40 years of global experience in industrial operations, corporate level management, engineering, design, consulting, teaching, research and professional service. He is a native of Butte, MT. His career includes positions with Thiokol Chemical Corporation, Key Tronic Corporation, Sunshine Mining and Refining Company, H. A. Simons Ltd. and at CAMP-Montana Tech. He holds a BSc in Chemical Engineering from Montana State University and an MSc from Montana Tech in Metallurgical Engineering and Ph.D from the University of Idaho in Mining Engineering - Metallurgy. He is a Fellow of both the Institution of Chemical Engineers and of the Institute of Materials, Minerals and Mining. He shares 13 international patents and 6 new patent applications covering several innovative technologies, 2 of which were successfully reduced to industrial practice. He currently serves as the Harrison Western Professor in the Kroll Institute for Extractive Metallurgy as part of the Mining Engineering Department and the George S. Ansell Department of Metallurgical and Materials Engineering at the Colorado School of Mines. In 2009 he was honored by the Society for Mining Metallurgy and Exploration with the Milton E. Wadsworth Extractive Metallurgy Award for his contributions in hydrometallurgical research. In 2015 he was awarded the International Precious Metals Institute’s Tanaka Distinguished Achievement Award. In 2016 he received the Distinguished Member Award from the Society for Mining, Metallurgy and Exploration, the Outstanding Faculty Award from the George S. Ansell Department of Metallurgical and Materials Engineering at Colorado School of Mines and also became a Distinguished Member of the U of Idaho Academy of Engineering. In 2017 he received the EPD Distinguished Lecturer Award...
from The Minerals, Metals and Materials Society. In 2019 he was named as a Henry Krumb Distinguished SME Lecturer. In 2019 he was also appointed as a Visiting Faculty within the Minerals Engineering Department of Central South University in China, the largest program of Mineral Processing and Extractive Metallurgy in the world.

**Dr. Courtney Young** is a graduate of three premier mineral/coal processing and extractive metallurgy institutions with a BS in Mineral Processing from Montana Tech in 1984, a MS in Mining and Minerals Engineering from Virginia Tech in 1987, and a Ph.D in Metallurgical Engineering from University of Utah in 1994. He has been a faculty member of Metallurgical and Materials Engineering at Montana Tech since 1993 where he has taught numerous courses in Mineral Processing and Hydrometallurgy. Other related courses include Fire Assay, Materials Handling Design, Flotation, Energy Resources, Gold Processing, and Materials Characterization and Analysis. During this time, Dr. Young has worked on numerous research and consulting projects with various funding sources, particularly mining companies. He has published and presented more than 150 papers. Most of his research has been in flotation, hydrometallurgy, and pyrometallurgy as well as their application to recycling secondary resources including but not limited to waste water, slag, tailings, printed circuit boards, plastics, etc. He recently stepped down from being Dept Head, a position he had for 21 years. As a result, Dr. Young is excited about teaching more and doing more research.

**U.S. MINING LAW ONE DAY SHORT COURSE AND HANDBOOK**  
*Cascade 5*

**Instructors:** Rew R. Goodenow, *Shareholder, Parsons Behle & Latimer, Reno, NV*  
Kevin Johnson, *Shareholder, Parsons Behle & Latimer, Salt Lake City, UT*

**Course Description**

Parsons Behle & Latimer’s one-day course will provide a comprehensive overview of the mining law in the United States relating to the acquisition, exploration, development, operation and closure of hard rock mining projects on public lands. Recent changes to the taxation framework in Nevada, current reclamation trust formation and employment practices in response to the COVID 19 pandemic have been added to this year’s course. The course provides in-depth coverage of types of land and mineral ownership in the U.S., types of mineral claims, historical and current issues under the General Mining Law of 1872, the process and issues involved in obtaining and holding mineral tenures, extralateral rights, an overview of environmental permitting, acquiring power, and an overview of water law in the western U.S. The course includes an overview of the typical methods for entering into exploration and development joint venture arrangements, including the revised Rocky Mountain Mineral Law Foundation “Form 5” limited liability company agreement, lease, purchase and sale of exploration and mining project issues, and a discussion of the standard royalty mechanisms including net smelter return and net profits interest royalties. The course also covers current significant environmental issues in the exploration and development of operations, including key air and water discharge issues, environmental impact statements, permitting of tailings facilities, bonding, and mine closure and reclamation issues. The course is ideal for persons who are interested in acquiring mining projects in the U.S., or simply wish to have a refresher on key concepts. The course will include an extensive 200+ page Mining Law handbook and appendices, which include various form royalty and other agreements.

(continued on next page)
2022 Short Course Program... (continued)

ONE DAY SHORT COURSES | TUESDAY DECEMBER 6 ...(continued)

U.S. Mining Law... (continued)

Schedule:
Tuesday, December 6, 2022

8:00- 9:45  Overview of Land, Mineral Ownership, and Mining Laws in the U.S., Jason Steiert, Associate, Salt Lake City, UT office

9:45-10:00  Coffee Break

10:00-10:45 COVID 19 Update: OSHA/MSHA, the ETS, Vaccine Mandates, and What Mine Operators Need to Know, Sean Monson, Shareholder, Salt Lake City, UT office

10:45-11:30 Detailed Review of the General Mining Law of 1872, Rew Goodenow, Shareholder, Reno office and Jason Steiert, Associate, Salt Lake City, UT office

11:30-12:00 Acquisition of Mineral Tenures, Rew R. Goodenow, Shareholder, Reno office

12:00- 1:00 Lunch Break

1:00- 1:45 Financing the Project & Ancillary Concepts, Kevin Johnson, Shareholder, Salt Lake City, UT office

1:00- 2:45 Essential Water Law Concepts, Greg Morrison, Associate, Reno, NV office

2:45- 3:00 Afternoon Break

3:00- 3:45 Structure of US Environmental Laws and Regulations, Ashely Nikkel, Shareholder, Reno, NV office and Rick Angell, Shareholder, Salt Lake City office

3:45- 4:30 Update to Minerals Taxation in Nevada and Reclamation Trust Agreements, Jamie Tract, Of Counsel, Reno office

4:30-5:00 Current Standards Applying to Mineral Resource and Reserves Reporting, Rew Goodenow, Shareholder, Reno office and Kevin Johnson, Shareholder, Salt Lake City office

About the Instructors

Rew R. Goodenow is a former president of the State Bar of Nevada and of the National Conference of Bar Presidents and served several years on Parsons’ board of directors. He has been lead counsel in many commercial and financial transactions. Rew advises mining companies and claimants, large and small, on mining claim title issues, including location and maintenance. Rew, together with Jim Butler represented a large silver mining company in a mining claim dispute where a third party had staked mining claims on the company’s active mining operations. Those operations continued undisturbed while the dispute was resolved, and the company retained its claims.

Currently, Mr. Goodenow serves, among other positions, as general counsel to the Board of Governors of the State Bar of Nevada. As the principal author of Nevada’s Limited Liability Company Act, Mr. Goodenow regularly provides advice and counsel in complex transactions involving such companies. He has been engaged by the Nevada Secretary of State to advise it on the digital operating agreement, among other topics. He also currently serves on the Board of Visitors of the National Judicial College and recently completed a full term on the Board of Governors of the American Bar Association, finishing as the chair of the
Kevin Johnson is a member of the firm’s Corporate Transactions & Securities, and Environmental, Energy & Natural Resources departments. While Kevin has significant experience in a number of industrial sectors, his practice focuses on devising structures to create value through transactions related to the purchase, sale, development, financing and commercialization of infrastructure and natural resources projects. He has represented national and international clients in a wide variety of transactions. When dealing with infrastructure and natural resources projects, Kevin says he “helps clients turn dirt into cash.”

Kevin previously was executive vice president and general counsel of Molycorp, Inc., a publicly traded international rare earth mining and processing company with corporate offices in Denver, where he was responsible for all aspects of Molycorp’s legal affairs on a global basis. Before joining Molycorp, Kevin was a partner at Holland & Hart in Denver, Colorado. Kevin began his legal career at The Dow Chemical Company, where he had the opportunity to live and work in Europe for five years. Kevin speaks Spanish.

MINE TO MILL RECONCILIATION: Tool for productivity improvement

Redwood 6

Instructor: Abani R. Samal, Ph.D, CPG, RM- SME, Fellow-SEG, Principal, GeoGlobal LLC, Salt Lake City, UT

Course Description
Mining is an integrated operation that includes exploration, mining (extraction), processing, and metallurgy where metals are extracted. A mining-plan of operation forecasts the amount of ore to be mined and/or metal to be produced at the beginning of the year. Success in annual production may be due to many reasons such as a good mine plan based on a nearly robust resource/reserve model; execution of mine-plan in the operation supported by reliable laboratory services and disciplined work-culture led by a competent workforce. Productivity of an operation is a comparison of the amount of ore mined or metals extracted vs. planned. A model-mine-mill (M3) reconciliation process helps to gain knowledge on the actual reasons for achieving the planned production or not.

In reality, when properly implemented, a detailed model-mine-mill (M3) reconciliation process leads to finding out the areas for further improvements leading to substantial improvements in productivity. A successful mining operation conducts the reconciliation at regular time intervals.

This workshop is designed to provide a forum for constructive discussion and learning on how mine to mill reconciliation can be helpful in improving productivity of the mining operation. The topic is very relevant to mining engineers, geologists and others in a producing mine.

1. Reconciliation: An introduction to the concept
   a. Fundamental definitions
   b. Mine planning, production and reconciliation
   c. Examples
2. Various types and nodes of reconciliation in a mining project: LT Resource/reserve, ST Resource/Reserve, Production, Stock piles and Mill
   a. Reconciliation between Long-term-Short-term resource estimations
   b. Reconciliation between Short-term resource model vs production data
   c. Mine planning vs production -

(continued on next page)
2022 Short Course Program... *(continued)*

ONE DAY SHORT COURSES  |  TUESDAY DECEMBER 6  ...*(continued)*

Mine to Mill... *(continued)*

- d. Issues with volumetric
- e. Process plant: Tons & grades received Grade estimation
- f. Drill density
- g. Time lag between ST planning and mining
- h. Stock piles: Quality and Quantity measurements AS/PV

3. Best practices
   - a. Error measurements
   - b. Examples

The workshop provides the participants an unique learning experience to the industry professionals.

**Format:** The workshop will be interactive and will consist of lectures and hands-on exercises. Participants will work with the instructor individually or, in group on small exercises which as intended to provide a unique learning experience.

**Workshop material:** The printed copies of the PowerPoint presentation slides will be provided. Selected articles / papers will also be used for discussions. Selected chapters of various published books will also be used in this course.

**About the instructor**

Dr. Abani Samal has a wealth of knowledge and experience in the field of economic geology and valuation of mineral resources. He has extensive training (MS and PhD) in economic geology and geostatistics. He is also well recognized for his expertise in advanced geostatistics and mineral resource estimation. He is proficient in English and Odia. Dr. Samal has both industry and academic teaching experience which uniquely qualifies him to deliver this training program. In last 20 years in industry, he has gained experience in various commodities including iron ore, Cu-Mo-Au, Au-Ag, Pb-Zn-Ag deposits around the world. He has > 15 years of iron ore experience on projects around the world. His outstanding contributions to the industry are well recognized through his publications and presentations of his research and findings in various national and international conferences. Dr. Samal is a registered member of SME (RM-SME), a certified professional geologist (CPG) and a Fellow of the Society for Economic Geologists (SEG).

Dr. Samal is a qualified person as per international resource reserve reporting standards such as JORC (Australia) and NI-43-101 (Canada). Dr Samal is also an honorary member of CRIRSCO.

Dr. Samal has offered many short courses in public domain and also on site projects. Dr. Samal is known for delivering difficult and challenging topics in simple language to make it more meaningful.

**Kick Off and Awards Reception**

Tuesday 6:00 - 8:00 pm ~ 5th floor, Chalet Terrace Room

Open to all attendees, please wear your badge. A great way to catch up with old friends. This hosted event is sponsored by:

The Nugget Resort, Ruen Drilling, Inc.,
WestLand Resources and Original Creations
STATE & PROVINCE REPORTS (Part 1) ~ Cascade 2

Area of Interest - Mineral Deposits, Geology & Exploration

Chaired by: John Muntean Ph.D., Director, Ralph J. Roberts Center for Research in Economic Geology (CREG) Arthur Brant Chair in Exploration Geology, Nevada Bureau of Mines and Geology, University of Nevada Reno

Session Description:
Want to hear about exploration and mining activities for the past year in Western States and Provinces? In this all-day session, Economic Geologists from Western US States and Canadian Provinces will report on the exploration and development activities in metals and industrials for the past year in their respective areas. These specialists will also provide their insight into new mineral commodities and areas which are experiencing activity, and opportunities and challenges. The afternoon session is finished with a summary of USGS activities and mineral exploration trends.

• British Columbia Exploration and Mining 2022, Gordon Clarke, M. Sc., P.Geo, Director Mineral Development, Geological Survey of British Columbia, Vancouver, BC CANADA

• Alaska 2022, Melanie Werdern, Mineral Resources Section Chief, State of Alaska, Juneau, AK

• The Status of the Mining Industry in New Mexico 2022, Virginia McLemore, Research Geologist, New Mexico Bureau of Geology and Mineral Resources, Socorro, NM


John Muntean

John Muntean is an Associate Professor with the Nevada Bureau of Mines and Geology (NBMG), at the University of Nevada Reno (UNR). There he serves as the Director of the Ralph J. Roberts Center for Research in Economic Geology, which is a mineral industry associates programs, where annual donations are pooled together to fund graduate student research on Nevada’s mineral deposits. He also is also the Arthur Brant Chair in Exploration Geology at UNR, and is currently serving as the Acting Director of the Nevada Bureau of Mines and Geology. In the past he worked for Placer Dome, Homestake, and Santa Fe Pacific.
ALASKA: The Minerals, the Standards, and the Challenges ~ Cascade 1

Area of Interest - Mineral Deposits, Geology & Exploration

Chaired by: Deantha Skibinski, Executive Director, Alaska Miners Association, Anchorage, AK

Session Description:
Amid massive supply chain shortages and a mad dash for domestic mineral production, Alaska’s mineral potential should make it a standout jurisdiction for new mining activity. But with inconsistent federal policies, the industry’s challenges are piling up. Hear from industry and supportive lawmakers about what can be done to help Alaska be new sources of minerals the nation so desperately needs.

- The Alaska Industrial Development & Export Authority Role in Forwarding Alaska Infrastructure, Alan Weitzner, Executive Director, AIDEA, Anchorage, AK
- The Graphite One Project, Michael Schaffner, Senior Vice President, Mining Operations, Graphite One Resources, Anchorage, AK

Deantha Skibinski

Deantha was born and raised in Anchorage and Big Lake, Alaska and is a graduate of the University of Alaska. She came to AMA from the Resource Development Council, where she worked as a projects coordinator for seven years. In that role, she advocated for the mining and tourism industries and managed efforts on the cruise ship head tax and mining shutdown ballot initiative campaigns and administered the Alaska Alliance for Cruise Travel, an organization promoting tourism businesses benefitting from visitors to our state. Deantha is an Executive Committee member of the Armed Services YMCA of Alaska, an organization dedicated to supporting military members and their families. She has served on past Governors’ Transition Teams, is a recipient of the Top Forty Under 40 award, and was one of a delegate to the first-ever Conference of Young Alaskans.
GROWTH COMPANIES ~ 5th Fl. Chalet Terrace

Area of Interest – Business & Finance

Chaired by: Tim Arnold, Chief Operating Officer, Integra Resources, Sparks, NV

Session Description:

The last year has been brutal for the mining sector. After struggling through the Covid crisis, we are hit with manpower shortages, retiring leadership, massive inflation, permitting bombshells and a very nervous investment community. In this session, developers and new operators will discuss the path they have taken to become successful in these troubling times. There will be short presentations, and a panel discussion moderated by none other than Integra’s Josh Serfass to dig deep into how these companies are coping, and discuss their outlook for 2023 and beyond. Speakers and Panelists:

- **DeLamar: Advancing a Project Through Volatile Times**, Josh Serfass, EVP, Corporate Development and IR, Integra Resources Corp., Sparks, NV

- **Awakening the Silver Queen**, Bill Howald, Executive Chairman, Blackrock Silver, Vancouver, BC, CANADA

- **Resource Growth and Risk Mitigation in a Bear Market**, Jason Kosec, CEO, Millennial Precious Metals Toronto BC, CANADA

- **i-80 Gold. Unlocking Value Through Centralized Refractory Processing**, Matt Gili, President and COO, i-80 Gold, Reno, NV

Tim Arnold

Tim Arnold has over 40 years of experience in hard rock mining. He has held positions in mining companies ranging from laborer to contract miner, and from shift boss through General Manager and COO. He has spent most his career either operating or developing mines. He is currently the COO for Integra Resources advancing the DeLamar project in Southwest Idaho towards production.

Arnold graduated in 1982 from the University of Idaho with a degree in Mining Engineering and completed an Executive MBA certificate program from Northwestern’s Kellogg Graduate School of Management in 2000. In 2016 he served the Society for Mining, Metallurgy and Exploration (SME) as its President, and has received numerous awards from SME, AIME and the University of Idaho.
MORNING SESSIONS | WEDNESDAY DECEMBER 7... (continued)
SESSION TIMES: 8:00 - 11:30 COFFEE BREAK 9:35 - 10:20

SUSTAINABLE MINING TO SUPPORT THE RENEWABLE ENERGY TRANSITION
~ Cascade 3

Area of Interest – Operations

Chaired by: David A. Ellerbroek, Vice President for Client Service and Strategy, Brown and Caldwell, Lakewood, CO and Dr. Ehsan Vahidi, Assistant Professor and John N. Butler Endowed Professor University of Nevada, Reno

Session Description:
Environmental impacts associated with metals and mineral production techniques have been significantly reduced in recent years. However, the current “green” mining techniques need to become more widespread and there should be a focus to investigate new environmentally friendly techniques. Massive investment in renewable energy technologies is required to support the transition to low-carbon technologies for producing electricity and to prevent the worst impacts of climate change. This investment needs to occur not only in developed countries but also in developing countries where approximately 2 billion people still don’t have access to reliable electric power. The challenge for the mining industry is to convert mineral development into a low- or zero-carbon process so that the benefits of installing renewable energy projects are not offset by carbon emissions from mineral development. This session aims to bring together researchers from academia and industry to exchange knowledge on developing, operating, and advancing sustainable and green mining technologies. Presentations providing perspective on both technical as well as policy-based challenges or broader mining engineering challenges toward sustainability are welcome.

• Assessing the Environmental Footprints of Gold Heap Leaching in Nevada, Sadded Kadivar, Graduate Research Assistant, University of Nevada-Reno

• Checking All The Boxes: Sustainable Mine Design for the Twin Metals Minnesota Project, Glenn Barr, Vice President Project Development, Twin Metals Minnesota, Ely, MN

• Environmental Footprints of the Lithium Production From Sedimentary Deposits in Nevada, Kamal Mousavi, Graduate Research Assistant, University of Nevada-Reno

Professional Poster Session Sponsored by: WSP Golder & General Sponsors
Participants are:

• Ramp Areas, Withdrawn Areas, Exploration Musings, E.A. Andy Johnson, Retired, Butte, MT

• Mineral Occurrence Map and GIS Database, Joseph A. Laravie, Great Basin GIS, Spring Creek, NV

• GIS and Geologic Map Compilation - Geologic Map of the Yearington Area, Joseph A. Laravie, Great Basin GIS, Spring Creek, NV
• Site Characterization and Design: Using Multiple Lines of Evidence to Inform Water Management, Kris Benusa, Manager - Environmental Studies, Twin Metals Minnesota, Ely, MN

• Assessing the Environmental Footprint of Rare Earth Elements Recovery from Coal Course Refuse, Mohsen Rabbani, Graduate Research Assistant, University of Nevada-Reno

• Assessing the Environmental Footprint of Smartphones Based on Design Evolution and Raw Materials Utilization, Sheida Nili, Graduate Research Assistant, University of Nevada-Reno

• Securing Investments in Sustainable Mineral Supply Chains for North America Rare Earth Element Deposits, Emma Ernst, Government Relations Strategist, GreenMet, Washington, DC

David A. Ellerbroek

Dave Ellerbroek works at Brown and Caldwell as Director of Client Service and has more than 30 years experience working in the environmental, water and engineering industries leading technical teams at the project, program and executive levels. His technical background includes working in the mining and oil and gas industry solving problems related to hydrology, geochemistry and environmental engineering. He also teaches part time at Western Colorado University with a focus on environmental management related to sustainability transitions and mine reclamation.

Dr. Ehsan Vahidi

Dr. Ehsan Vahidi received his B.Sc. and M.Sc. degrees in Metallurgical Engineering, from Sharif University of Technology and the University of Tehran, respectively. After earning his second master’s degree in Environmental Engineering from the University of South Florida, he obtained his Ph.D. from Purdue University in Environmental & Ecological Engineering. His Ph.D. research on the sustainability assessment of rare earth production sponsored by the Department of Energy led to several awards including the first-ever Ecological Sciences and Engineering (ESE) Outstanding Research Award, the 2018 College of Engineering Outstanding Graduate Student Research Award, and the prestigious Donnan Dissertation Fellowship from the Purdue Graduate School.

EXPLORATION AND MINE PERMITTING: SUCCESS STRATEGIES FOR A CHANGING PROCESS ~ Cascade 4

Area of Interest – Environmental

Chaired by: Ben Veach, PE, U.S. Mining Sector Leader, Stantec, Reno, NV and Rob Mullener, Permitting Manager, DeLamar Mining Co., Boise, ID

Session Description:
Over the last year, administrative changes to procedures have taken effect on both federal and private lands. These changes have a definite impact on the permitting of mines and exploration projects. Procedures for permitting will continue to evolve and have an impact on our industry. How are others finding success? What is working and what is not? This session will explore how the changes to permitting and environmental regulations have impacted the landscape for mining and exploration. What are the results of changes
Exploration and Mine Permitting... (continued)
and how are they impacting our industry? Learn from the experts how to avoid painful delays in permitting. Topics will include NEPA, USFWS Permitting, Mine Planning and Groundwater Successes and Failures.

• Effective Reclamation Begins at the Baseline Studies, Dillon Jessie, Principal Reclamation & Soils Specialist, Cedar Creek Associates, Inc., Ft. Collins, CO

• Permitting Mines and Exploration in Alaska, Victor Ross, Chairman, Alaska Minerals Commission, Anchorage, AK

• Mine Permitting in California: Navigating the Intersection of State, County, and Federal Processes, David Cerasale, Senior Vice President, WestLand Resources, Portland, OR

• Critical Success Factors for Permitting Schedules, George Fennemore, Senior Environmental Manager, Stantec, Elko, NV

• Preplanning and Maintaining the Course to Plan Approval, John Sherve, Field Manager & Scott Distel, Planning & Environmental Coordinator, BLM Battle Mountain District, Nevada

Ben Veach, PE
Ben, a Principal in the Environmental Services group, is responsible for the operations within the Stantec Mining footprint in the US. He brings more than 30 years of Nevada consulting experience as a project manager, engineer, and land use planner. His primary responsibility is to provide environmental mining support to the Stantec staff and clients across the US. His duties include being the responsible safety officer, financial lead, and all things related to the operation and maintenance of the Stantec Quality Management program. He leads a group of NEPA specialists, Wildlife biologists, Geologists, and Water specialists, all focused on serving the mining industry. Ben brings a unique mixture of civil engineering and land use planning to the team that is useful at improving communications and focus to the project team. He has proven the ability to lead diverse teams of professionals from project inception through build-out on a wide range of projects.

Rob Mullener
Mr. Mullener has amassed over 25 years of professional experience in the areas of mine permitting, geology, mining geology, engineering, and project management. His experience includes geologic mine planning, mine modeling, metal and nonmetal resource evaluations, site assessments, geophysical investigations, geologic field mapping, geologic drafting, collecting and analyzing field data, supervising drilling, surveying, overseeing construction crews, providing oversight of environmental regulations and procedures, and complying to strict environmental regulations in sensitive areas. He has also acted in the role of senior designer/CAD Coordinator for process mechanical and civil engineering projects, including field investigations, construction oversight, and three-dimensional (3D) modeling. Mr. Mullener is currently the Permitting Manager for Integra DeLamar and is actively engaged in permitting the DeLamar Mine in southwest Idaho along the Oregon border.
OLD MEETS NEW: MERGING OLD SCHOOL TACTICS WITH NEW TECHNOLOGY TO DEFINE AND MANAGE SOCIAL, POLITICAL, REGULATORY, AND REPUTATIONAL RISK - Positive Strategies for Media, Community Engagement, and Social License ~ Cascade 5

Area of Interest - LEGISLATIVE & PUBLIC AFFAIRS

Chaired by: Adam Hawkins, President, Global External Relations, Phoenix, AZ

Session Description:
You will learn from industry experts on how to build and maintain a coalition of support around your operation. This session will show you how to use tried and true, as well as modern tactics for growing and maintaining your project’s support base. This will include:

- Back to the Basics: A quick refresher of how to communicate in a way that gets measurable results.
- Simplifying Data Analytics: Understanding and using public opinion research to help you identify audiences and communicate with them effectively.
- Understanding Risk: Dive into the factors around social, political, regulatory, and reputational risk. Develop strategies for risk mitigation/elimination.
- Using Modern Methods: Discover new ways to assess risk and mitigate risk factors.
- Making Your Message Viral: Learn the tricks of the trade that social media influencers use to engage and energize your support base.
- Grassroots 101: Learn how to build traditional support coalitions and keep supporters engaged and on message.

Adam Hawkins

Adam is one of the leading practitioners in social license to operate – the support needed from the community to develop and sustain large-scale projects. He lectures frequently on the subject and has helped clients across the globe develop successful community engagement plans. A fixture in the public affairs, communications, and lobbying community for over a decade, Adam’s insight is sought after and trusted by clients across the globe. Adam started his career as a staffer in the United States Senate. Prior to launching Global, Adam worked in house for Rio Tinto and within two leading public policy firms, assisting clients on issues that included environment; water, natural resources, taxation, HR, commerce, transportation, and public lands. All of this experience has made Adam adept at working with key regulators such as the Environmental Protection Agency, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service, Mining Safety and Health Administration, and Army Corps of Engineers. Adam graduated with honors from Thunderbird School of International Business with a MBA and holds a BA/BS from Arizona State University.

Wednesday Afternoon Coffee Break is Sponsored by:

Jackson Kelly PLLP, Headwater Gold and the General Convention Sponsors.
2022 Technical Session Program… (continued)

AFTERNOON SESSIONS | WEDNESDAY DECEMBER 7
SESSION TIMES: 2:00 - 5:30  COFFEE BREAK 3:35 - 4:20

STATE & PROVINCE REPORTS (Part 2)~ Cascade 2

Area of Interest - Mineral Deposits, Geology & Exploration

Chaired by: John Muntean Ph.D, Director, Ralph J. Roberts Center for Research in Economic Geology (CREG) Arthur Brant Chair in Exploration Geology, Nevada Bureau of Mines and Geology, University of Nevada Reno

Session Description:
Want to hear about exploration and mining activities for the past year in Western States and Provinces? In this all-day session, Economic Geologists from Western US States and Canadian Provinces will report on the exploration and development activities in metals and industrials for the past year in their respective areas. These specialists will also provide their insight into new mineral commodities and areas which are experiencing activity, and opportunities and challenges. The afternoon session is finished with a summary of USGS activities and mineral exploration trends.

- Idaho Mining and Exploration, 2022, Virginia S. Gillerman, PhD, Research Geologist, Idaho Geological Survey, Boise, ID
- Utah Mining 2022, Jake Alexander, Geologist, Energy & Minerals Program, Utah Geological Survey, Salt Lake City, UT
- Update on 2022 Nevada Exploration, John Muntean, Research Economic Geologist/Associate Professor, Nevada Bureau of Mines and Geology, University of Nevada, Reno

ACCESSING CAPITAL FOR EXPLORATION, DEVELOPMENT & OPERATIONS ~ Cascade 4

Area of Interest - Business & Finance

Chaired by: Tim Alch, Financial Analyst, Managing Partner, TAA Advisory LLC, Edgewater, NJ

Session Description:
What are the successful miners and explorers doing to access capital? What are recent key trends telling us? What can owners, operators and stake holders do to increase the odds of attracting investors and capital? Join us for a lively discussion and q&a with leading experts about the latest issues, trends and ways to get the right attention. Get your questions answered.

- Christmas Presents and Death Spirals - Two Sides of the Same Coin, Kai Hoffmann, Managing Director, SOAR Financial Partners, Frankfurt, GERMANY
- Prospects and Financing Issues as Economic Fundamentals and Politicians Move in Opposite Directions, Richard (Rick) Reeves, Managing Director, Northcott Capital LLC, Denver, CO
- Going Green: Integrating the Value of Natural Capital from Project Concept to Completion, Jody Bickel, CEO, Founder, CreekBank Associates, Champagne, IL
• Flexible Financing Options for Mine Water Treatment, Lee Josselyn, P.E., Senior Engineer, Linkan Engineering Ltd., Golden, CO

• The Role of Government Entities and the Importance of Access to Private & Institutional Sources of Financing for Mining Projects Related to Critical Minerals, Edmundo Laporte, P. Eng., CPEng, Director of International Business Development, Principal Consultant, RESPEC, Lexington, KY

• How Mining Companies Can Use Insurance to Reduce Their Risk Profile, Justin Anderson, PE, Senior Vice President, McGriff Insurance Services, Denver, CO

• Mine Finance: Impact of EV Revolution and Other Climate Change Technologies, Cynthia Urda Kassis, Partner, Head of Project Development & Finance Lead Industry Coordinator for Mining & Metals, Shearman & Sterling LP, New York, NY

• Rescuing Distressed Assets and Protecting Yourself Against Troubled Customers and Vendors, Travis McRoberts, Partner, Squire Patton Boggs, Dallas, TX

Tim Alch

Tim is Managing Partner of TAA Advisory. Tim is known for project management, team building, corporate and business development and financial and investment and minerals market advisory. His career spans equity, investment analysis, executive placement and event management. He is a Senior Associate of and was a Managing Director of Behre Dolbear; SVP of Anderson & Schwab; Equity Analyst at Paine Webber, Prudential Securities, and Dean Witter Reynolds and Senior Consultant: Industry Analyst at CRU International (London), World Steel Dynamics (New York) and Resource Strategies (Philadelphia). He is an Honors Geology graduate and John Mason Clarke fellow Amherst College and studied Mineral Economics at Penn State. Tim is a member of SME, AEMA, PDAC & NCUSCR; an Executive Committee Member (2008-16) and Executive Director (2016-21) of NY SME; and an SME Finance Strategic Committee Member (2017-20). In 2020 Tim was selected as the 2020 recipient of the SME President’s Citation for Local Section Service Award.

Wednesday Keynote Luncheon
Noon - 1:30 ~ 1st Floor Celebrity Showroom

Guest Speaker Chris Welton
Rio Tinto Exploration Director for the Americas
Exploration, the Lifeblood of a Sustainable Mining Industry
Sponsored by
Crowley Fleck PLLP, Matrix Drilling Products, SVL, Rio Tinto & Teck American Incorporated
NEW PROJECTS IN OLD DISTRICTS ~ Cascade 5

Area of Interest - Operations

Chaired by: Kennet Bertelsen, PE, Senior Civil Engineer, Morrison-Maierle, Spokane, WA and Sam Siebenaler, Vice President Corporate Development, Big Rock Industries, Cascade, CO

Session Description:
Old mining districts can offer a wealth of opportunity for the right project including but not limited to new mines. As the regulatory landscape continually changes, so do the opportunities and challenges presented by historic mining districts. This session will host presentations by those who are pioneering new projects in old mining districts. Projects range from new mines taking advantage of the same commodity the area was known for, to projects with no connection to the districts’ original claim to fame.

- New Eyes on Old Rocks: A New Structural Model Reinvents a World-Class Gold District - Black Hills, South Dakota, Rob Bergman, President, F3 Gold, Minneapolis, MN
- Modern Exploration at the Historic Silver Camp Belmont - Nye County, Nevada, Mark Travis, Vice President of Explorations, Nevada Silver Corporation, Carson City, NV
- Orogenic Gold Mineralization in the Neoarchean South Pass Greenstone Belt - South-eastern Wind River Mountains of Wyoming, Dean Peterson, Chief Geologist, Big Rock Exploration, Duluth, MN
- Stibnite Gold, What’s Happening? - Yellow Pine, Idaho, Lyon Mckinsey, Vice President External Affairs, Perpetua Resources, Donnelly, ID
- Ruby Hill Mine, TBA, Ridgeline Minerals, Winnemucca, NV

Kennet Bertelsen
Kennet is a senior civil engineer providing project management and design oversight on a variety of infrastructure projects for private and public clients. He has provided fresh water supply, booster station, stormwater analysis, haul road design, and wastewater treatment infrastructure planning and design to mining clients in Alaska, Montana, Idaho, Wyoming, Nevada, and Colorado. Throughout the Pacific Northwest he has worked on industrial site characterization and redevelopment for warehouses, production facilities, maintenance facilities and fuel storage/distribution, including development within superfund sites. This includes completing fuel storage containment design and 40 CFR 112 compliance for over 60 new and existing sites.

Sam Siebenaler
Sam is an Economic Geologist with nearly 20 years of experience, including 15 years in mining and exploration. He is currently the VP of Corporate Development, helping manage growth strategies for multiple companies, including companies undertaking junior exploration, geologic exploration consulting, and critical mineral recycling. He formerly worked as a Senior Geologist II at Newmont Mining, where he was involved with exploration project development, economic analysis, royalty oversight, strategic planning, metallurgical studies, and geotechnical work. He also is experienced
in sales, lead generation, marketing, and estimating. Before entering the mining industry, he served in the US Army as an Information Systems Assurance Officer. He has a passion for leadership and enjoys mentoring early career geologists as well as transitioning military veterans.

TECHNICAL AND PARTNERSHIP STRATEGIES FOR HARDROCK AML CLEANUP ~ Cascade 3

Area of Interest - Environmental

Chaired by: **Kate Garufi, PMP** - Rocky Mountain Remediation Lead, HDR, Denver, CO and **Natalie Mullenberg, PMP, CAPM** – Program Manager, Watershed Improvement Unit, Arizona Department of Environmental Quality, Tempe, AZ

**Session Description:**
Over 150 years of mining history in the United States has resulted in over half a million abandoned or inactive hardrock mine sites located on public, private, and tribal lands across the country. Abandoned or inactive mines may include waste rock and overburden dumps, tailings, unstable surface and underground mine water impoundments, acid mine drainage, discharging adits, and heap leach piles. The impact of abandoned mines is significant; contaminants from mining affect the biological, recreational, industrial, and municipal use of watersheds for many miles. In addition to numerous environmental hazards, abandoned mines present threats to public safety like open shafts and confined spaces with atmospheric hazards. Aside from the sheer magnitude of potential sites and widespread impacts, many of the original miners are long gone, leaving a significant funding shortfall and liability challenges that further complicate the management and remediation of these sites.

Hear from federal, state, tribal, and private speakers about source control technologies, modeling and water quality improvement assessments, and multi-party partnerships that have resulted in expedited and successful AML cleanup, watershed improvements, and site reuse.

**Session 1 (95 min): The Great Balancing Act: Project Management Strategies to Expedite Abandoned Mine Cleanup and Improve Watersheds While Balancing Regulatory Uncertainty**

This session will be a collection of case studies focused on AML site cleanup strategies that balance source control technologies, watershed modeling, and water quality improvements metrics and measurements to promote effective, efficient, and realistic cleanup of AML sites, and answer that age-old question: How clean is clean enough?

**Session #1 Speakers**
- **Three R Mine: Partnership Case Study**, **Daryl Longwell, PE, Environmental Engineer**, Tetra Tech, Golden, CO
- **Tribal Collaboration at Legacy Mining Sites: Involving Tribes early in Baseline Studies, Closure Planning, and Environmental Remediation**, **Avi Buckles**, Director of Cultural Resources, WestLand Resources, Tucson, AZ
- **The Bunker Hill Superfund Site and the Coeur d’Alene Trust - Strategic Management of Environmental Remediation with an Eye on the Past, Present and Future**, **Kyle Richards**, Senior Program Manager, Coeur d’Alene Trust, Kellogg, ID

**Session 2 (70 min): Improving the Legacy: How Local Partnerships and National Initiatives Are Advancing Abandoned Mine Cleanup**

This session will be a panel session with Federal, State, Tribal, and private sector panelists that will provide a brief update on Good Samaritan regulations and discuss AML cleanup successes, focusing on legal and non-legal tools for partnerships to advance AML clean

(continued on next page)
Technical And Partnership Strategies... (continued)

up. Each panelist will provide a brief presentation focused on partnership tools/strategies used at AML sites, common pitfalls, and lessons learned. These brief presentations will be followed by a facilitated Q&A session with strong audience participation encouraged.

Session #2 Panelists:

- **Jason Willis**, CO AML Program Manager, Trout Unlimited, Inc., Salida, CO
- **Jeff Graves**, Director, Inactive Mine Reclamation Program, Colorado Department of Reclamation, Mining & Safety, Denver, CO
- **Dave Gosen**, Manager, Remediation Projects, Freeport Minerals Co., Phoenix, AZ
- **Jim Harrington**, CEO/CTO, Ensero Solutions, Inc., Centennial, CO

Kate Garufi
Kate is a senior project manager with over 18 years of experience. She serves as HDR’s Rocky Mountain Remediation Lead, Site Investigation and Remediation Practice Group Chair, and remediation service line lead for HDR’s Mining Team. Kate is an experienced environmental remediation leader with national remediation program management and implementation experience. Proficient in environmental regulations and with a knack for problem-solving, she has supported the development and implementation of remediation strategies at complex Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) projects across the country. Her experience also includes planning, compliance, and remediation support at active mines, inactive mines, and abandoned mine lands pursuant to Federal and State regulations. Before transitioning the consulting, she served as a proven expert and go-to national resource for the USEPA’s Headquarters Superfund (CERCLA) Remediation Office in hazardous waste and abandoned mine land cleanup, CERCLA and Resource Conservation, and Recovery Act (RCRA) policy, and Superfund site management. During her time at EPA, she successfully managed the development and implementation of national policy and was a leader in change management efforts in Superfund site remediation.

Natalie Muilenberg
Natalie Muilenberg, PMP is the Watershed Improvement Unit Manager at the Arizona Department of Environmental Quality, where she leads a team of hydrogeologists and scientists in delivering impactful projects that reduce contamination in Arizona’s rivers and streams. She oversees the state’s efforts to remediate abandoned mine lands, mitigate non-point source pollution, and engage community scientists. With a background in biology, creative writing, and sustainability, she enjoys finding interdisciplinary solutions to Arizona’s most pressing environmental and public health challenges. When she isn’t in the field for work, she’s outside enjoying Arizona’s mountains and surface waters.

Exhibit Hall Bars are Sponsored by:
Perpetua Resources and MRC Recruiting
MULTIPLE USE ON PUBLIC LANDS AND THE NATION’S NEEDS FOR MINERALS ~ Cascade 1

Area of Interest - Legislative & Public Affairs

Chaired by: Laura Granier, Partner, Holland & Hart, Reno, NV

Session Description:


Panel I: The Interagency Work Group’s Request for Information: A Prelude to Efforts to Overhaul the Mining Law - Or an Opportunity to Improve Key Mining Policies and Streamline Permitting

The Biden Administration’s Interagency Working Group’s (IWG’s) Request for Information on the Mining Law, mining regulations, and permitting has posed important questions about land tenure, environmental issues, permit streamlining, and strengthening our Nation’s mineral supply chains to lessen our reliance on foreign minerals. In the 2021 Bipartisan Infrastructure Law, Congress directed the Secretaries of the Interior and Agriculture to prepare a report that makes suggestions for how to shorten permitting timelines, which Congress has determined are contributing to the country’s inability to produce the minerals we need – including the critical minerals needed to build clean energy infrastructure and power EVs. The Secretaries have tasked the IWG with preparing this report. This panel will discuss the IWG’s mission, the mining industry’s robust response to the Request for Information, the status of the IWG’s report, and how the report may influence future rulemakings and legislation dealing with key public lands and mining issues.

- Debra Struhsacker, Environmental and Government Relations Consultant, Reno, NV
- Justin Prosser, Director for Congressional Affairs, National Mining Association, Washington, DC
- Carolyn McIntosh, Senior Partner, Squire Patton Boggs, Denver, CO

Panel II: Updates on Hot Legal Mining Topics: Rosemont, Earthworks, and RMPs

- Jessica Freitas, Natural Resources Attorney, Holland & Hart, Reno, NV
- Laura K. Granier, Partner, Holland & Hart, Reno, NV

Laura Granier

Laura Granier is a partner at the law firm of Holland & Hart where she focuses her practice on mining, energy and natural resource issues. Her practice includes regulatory work and litigation with a focus on natural resources, mining law, public lands, energy, and water. She has successfully handled issues of first impression involving mineral resources in Nevada and has been extensively involved in the land use planning process in Nevada for Greater Sage Grouse conservation efforts. Laura was lead counsel for the nine Nevada counties and several private plaintiffs who successfully challenged the 2015 land use plan amendments — obtaining an order from the United States District Court for Nevada remanding the LUPAs. Ms. Granier has successfully handled litigation involving complex land tenure issues for various mining projects throughout Nevada. She has worked closely with state legislators in previous sessions on challenging issues related to water, mineral resources, revenue, education and land use. Her regulatory experience includes a broad spectrum of work before various agencies with regulatory jurisdiction over environmental issues, mining, water, education, taxes, land use, and public utilities.
MORNING SESSIONS | THURSDAY DECEMBER 8  
SESSION TIMES: 8:00 - 11:30  COFFEE BREAK 9:35 - 10:20

DOMESTIC CRITICAL MINERALS DEVELOPMENT: Battery-powered Rubber  
Hitting the Road or Deer in the Headlights? ~ Cascade 1

Area of Interest - Mineral Deposits, Geology & Exploration

Chaired by: Christopher Dail, Manager, Exploration, Perpetua Resources., Donnelly, ID and Peter Vikre, U.S. Geological Survey, Reno Office, Geology, Minerals, Energy and Geophysics Science Center, Mackay School of Earth Sciences and Engineering, University of Nevada-Reno

Session Description:
Supplies of largely imported critical minerals, characterized by absence or long running decline of domestic production, have been further compromised by supply chain bottlenecks resulting from the COVID-19 pandemic and Ukraine invasion. Increasing support for domestic production of critical minerals by government agencies (DOD, DOE, DOI) has resulted in development of mine plans and processing facilities for mostly to entirely imported battery components (Li, Co) and commodities necessary for energy production, national defense, and technological competitiveness (REE, Te, Ni, Nb...). This session will explore government-industry commitments to new mine and processing facility developments with an emphasis on advanced projects that have future production of critical minerals in the headlights.

- Cost Effective Multi-Critical Mineral Mining, Beneficiation and Processing - The Hicks Dome Structure, Illinois - A Proposed National Project Template, Joseph H. Baird, Partner, Baird Hanson LLP, Boise, ID
- Rare Element Resources - General Atomics - DOE: Rare Earths Processing and Separation in Wyoming, George Byers, Consultant to Rare Element Resources, Eagle, ID
- Precious and Base Metal Mineralization Within the Peridotite Zone of the Stillwater Complex, Craig Bow, Ph.D, Sr. Geological Advisor, Stillwater Critical Minerals, Vancouver, BC CANADA

Chris Dail

Chris has 35 years of experience as an exploration geologist. His experience includes project to program level planning and execution across several continents and on a variety of mineral deposit types. Chris’ role at Perpetua Resources is primarily focused on identifying and evaluating the exploration potential for new prospects and deposits within the project area. Chris has been with Perpetua since the company was founded. He decided to join the project because of the opportunity to help restore fisheries and habitat at the site and bring stable, well-paying jobs to a rural area depending on seasonal, often low paid tourism-type jobs. He believes Perpetua’s goal to use modern mining practices and leave behind positive legacy. Chris enjoys recreating throughout Idaho and the surrounding region including cross country and downhill skiing, rafting, sailing his historic wooden sailboat in lake Coeur d’Alene and hiking through the variety of terranes in the region with his wife.
Peter Vikre

Peter Vikre is a research geologist with the US Geological Survey in Reno, Nevada, where he investigates the characteristics and origin of metal deposits in the western United States. Recent research has focused on the sources of components of hydrothermal minerals that comprise metal deposits, and on inventorying domestic critical mineral resources in intrusion-related deposits. He has authored numerous publications on these themes. Previously he was the exploration manager of the Great Basin division for ASARCO Incorporated. He holds a BA degree from Dartmouth College, and MS and PhD degrees from Stanford University.

STUDENTS & EARLY CAREER PROFESSIONALS ~ Cascade 4

Area of Interest - Business & Finance

Chaired by: Dale Kerner, Permitting Manager, Perpetua Resources, Donnelly, ID and Sena Cicek, Geotechnical Engineer - Leeville Underground Complex, Nevada Gold, Elko, NV

Session Description:
It’s what you know, who you know….and who knows YOU. Engagement and exposure with mining industry professionals is advantageous for students and those in the early stages of their careers. Whether its landing that first job or identifying new opportunities for development, learning the value of networking early and often is a high-value life skill. This session provides a venue for (1) students seeking to demonstrate their interest in advancing mining through their academic research, or (2) junior professionals who want to bring new ideas or observations to their peers. Attendees should come ready to meet those who are (and will be) shaping the future of our nation’s mining industry.

• Is Cyanide Loss Caused by Microbes in a Heap Leach Facility?, Joseph H. Lazarus, Environmental Scientist, Enviromin, Bozeman, MT

• A Geochemical Modeling Approach to Understanding Arsenic Treatment by Zero-Valent Iron in a Permeable Reactive Barrier: A Case Study, Jenna Adams, Geochemist, Haley & Aldrich, Boise, ID

• Ore Control Geology at Nevada Gold Mines’ Leeville Underground Mine, Will Ebbert, Ore Control Geologist, Nevada Gold Mines, Leeville, NV

• Recommendations to the Industry, Emily Carroll, Junior Mining Engineer, Piedmont Lithium, Inc. Belmont, NC

• The Value of Lab Scale Testing for Evaluating a Full-scale Bioreactor at an Operational Mine, Ethan Wologo, M.S., Environmental Scientist, Enviromin, Bozeman, MT

• Water Resources-Based Cover System Design for a Ridgetop Mine, Kelly Kindgren, Staff Environmental Engineer, Arcadis-U.S., Highlands Ranch, CO, and Linley Mescher, EIS, Civil &Environmental Engineering, Arcadis-U.S., Inc., Portland, OR

(continued on next page)
Dale Kerner

Dale Kerner is a Professional Geologist licensed in the State of Idaho. He currently serves as the Permitting Manager for Perpetua Resources, working to obtain the many permits and approvals required for mining and reclaiming the historic Stibnite Gold Project in central Idaho. Prior to joining Perpetua Resources predecessor, Midas Gold in 2017, Dale had an 18-year career in environmental consulting that included geological exploration, mine planning & permitting, and NEPA project planning and coordination. Dale obtained degrees at Boise State University (MS Geology) and the University of Wisconsin/Eau Claire (BS Geology). Dale is an active member of the SME Boise Section and the Idaho Mining Association Conference Planning Committee. He utilizes these platforms to build meaningful connections between the mining industry, the public and the educational institutions that are developing our nation’s future mining workforce.

Sena Cicek

Sena Cicek is a geotechnical engineer at Nevada Gold Mines’ Leeville Underground Complex. Sena holds BSc and MSc degrees in Mining Engineering from Middle East Technical University (METU) and West Virginia University, respectively. Sena’s university research included developing a methodology for rating floor quality in underground coal mines which encountered floor failure (Coal Mine Floor Rating [CMFR]). Sena is an active member of the Society of Mining Metallurgy and Exploration (SME); she helped establish the SME Student Chapter in Turkey and is currently working as a Section Counselor for the SME METU Student Chapter. She serves on SME’s Young Leaders Committee (YLC), is co-chair of the YLC Global Section Subcommittee (2019-2020) and contributes to a variety of SME committees and subcommittees. In 2022, she was nominated for the SME Board of Directors Internship Selection Committee, and Mining & Exploration Representative for the Mining Engineering Committee. Sena’s career ambitions include a leadership role in operations oversight where she can promote diversity and inclusion, effective communication and employee recognition, and an atmosphere of equal opportunity with a focus on continuous improvement of the workplace and work practices.

Welcoming Reception

Wednesday 5:30 - 6:30 pm in the Exhibit Hall
Sponsored by:

Boart Longyear Company, Foth Infrastructure & Environment, Knight Piésold, Millcreek Engineering Co., Perkins Coie, RESPEC Company, LLC & Teck American Incorporated
MINING HYDROLOGY ~ Cascade 5

Area of Interest - Operations

Chaired by: Ronald T. Parratt Jr., Water & Energy Specialist, Newmont Mining Corporation, Victor, CO and Mike Hardy, Senior Project Manager, Lumos & Associates, Reno, NV

Session Description:
The various aspects of minerals extraction all have challenges to overcome related to water. Whether they are related to sustainability, environmental regulations, exploration, development or operations; challenges related to water continue to drive decision making. This session seeks to present various challenges related to water within the current landscape of mining, and exploration, and the solutions applied meet project and company goals and requirements.

• Stacked Dynamic Profiling of Long-Screened Test Wells - An Alternative to the Conventional Zone Test for Potable Supply Wells, Noah Heller, CEO/President, BESST, Inc., San Rafael, CA

• Innovative Approach to Groundwater Supply and Aging Wellfield Challenges, Brandon McLean, Principal Hydrology, Brown and Caldwell, Lakewood, CO

• Site Characterization and Design: Using Multiple Lines of Evidence to Inform Water Management, Kris Benusa, Manager - Environmental Studies, Twin Metals Minnesota, Ely, MN

• Maintaining Balance - Mining and Water Balance in California, Kelly Collins, Managing Principal Hydrology, Brown and Caldwell, Lakewood, CO and Angela Brush, Client Service Manager & Principal Geologist, Brown and Caldwell, San Diego, CA

• Isotopic Tracing of Acid Rock Drainage Sources and Flowpaths at the Bunker Hill Lead-Zinc-Silver Mine, Silver Valley, Idaho, Jeff Langman, Associate Professor of Hydrogeology, University of Idaho, Moscow, ID

Ronald T. Parratt, Jr.

Ronald Parratt is a professional mining hydrogeologist working as the Site Water Coordinator – Water and Energy Specialist for Newmont Mining Corporation at their Cripple Creek and Victor operations in Colorado. He has 15 years of experience and expertise in mining hydrology including, ground water modeling, mine dewatering, water quality program management, and permitting. His interest in hydrogeology began while working as a driller’s assistant for Layne Christensen Drilling in AZ. This inspired him to get his master’s degree in Hydrogeology at the University of Nevada, Reno. He worked for Newmont as an Engineer II: Hydrogeologist at their Twin Creeks, Midas and Phoenix mines and during his time with Schlumberger Water Services, he worked as a Project Hydrogeologist on several projects throughout Nevada, Idaho and Chile. In his spare time, he enjoys being in the outdoors with his family, golfing and hiking.

Michael Hardy

Michael has over 30 years in the field of water resources with the majority of his experience in regional groundwater characterization and analysis, water rights, well field management, and exploration and production well drilling. Michael began his career as a hydrogeologist for an in-situ lithium mining operation in western central Nevada. Some of his responsibilities included managing an extensive wellfield (60 plus wells), company water rights and conducted multiple well drilling projects. After 9 years, Michael
2022 Technical Session Program... (continued)

MORNING SESSIONS | THURSDAY DECEMBER 8
SESSION TIMES: 8:00 - 11:30  COFFEE BREAK 9:35 - 10:20

Mining Hydrology... (continued)
went to work for water resource company where he was a project manager of large water infrastructure projects in excess of $4.3 million. Michael joined Lumos & Associates, Inc. in 2003 where he has managed multiple large groundwater investigations, water infrastructure projects and water rights. Michael is also a very active member with the Nevada Water Resources Association where he was a Board Member, past President and Treasurer for the organization.

NEPA REFORM & PERMITTING FOR STRATEGIC MINERALS ~ Cascade 3

Area of Interest - Mineral Deposits, Geology & Exploration

Chaired by: Edward (Ted) Boling, Partner, Perkins Coie LLP, Washington, DC and Kaycee May Royer, Associate, Perkins Coie LLP, Boise, ID

Session Description:
This session will provide an updated critical look at NEPA since President Biden announced policy support for sustainable production of “strategic and critical materials necessary for the clean energy transition — such as lithium, nickel, cobalt, graphite, and manganese for large-capacity batteries” (Memorandum on Presidential Determination Pursuant to Section 303 of the Defense Production Act of 1950, as amended | The White House). Additionally, the session will focus on the Council on Environmental Quality’s amendments to its government-wide NEPA regulations. CEQ has committed to a “comprehensive reconsideration of the 2020 Rule to evaluate its legal basis, policy orientation, and conformance with Administration priorities, including the Administration’s commitment to addressing climate change and environmental justice.” Under Executive Order 14008, CEQ’s NEPA review will need to include provisions “to ensure that Federal infrastructure investment reduces climate pollution, and to require that Federal permitting decisions consider the effects of greenhouse gas emissions and climate change” and “to accelerate the deployment of clean energy and transmission projects in an environmentally stable manner.” Finally, the session will cover the Biden-Harris Administration’s Fundamental Principles for Domestic Mining Reform. (https://www.doi.gov/sites/doi.gov/files/biden-harris-administration-fundamental-principles-for-domestic-mining-reform.pdf)

The panel will feature NEPA experts with practical experience concerning mining projects. The presentations and discussion will focus on the CEQ’s Phase 1 changes to Purpose and Need and Effects regulations, the Phase 2 proposals for comprehensive amendment of the 2020 regulations, the implications of changes directed by Administration policy, and provide an update on the changes CEQ is considering with examples of incorporating clean energy and mining reform principles into NEPA documents. The session will cover other current developments regarding NEPA in the courts and Congress.

Panelists include:
• Steve Feldgus, Deputy Assistant Secretary for Land and Mineral Management, U.S. Department of the Interior, Washington, DC
• Patty McGrath, Senior Mining Advisor, U.S. Environmental Protection Agency, Seattle, WA

CLE Credits Pending
Ted Boling

Edward (Ted) Boling served as the country’s top National Environmental Policy Act (NEPA) attorney as an associate director at the Council on Environmental Quality (CEQ) in the Executive Office of the President. Ted served at CEQ, the U.S. Department of the Interior (DOI), and the U.S. Department of Justice (DOJ) in Democratic and Republican administrations. His experience includes deep involvement in federal infrastructure permitting issues and the first comprehensive revision of CEQ’s NEPA regulations in 40 years.

Drawing on over 30 years of high-level public service, Ted currently advises leaders on transportation and energy development projects, agencies that must hire outside counsel, and the environmental professionals that support them on the development of renewable energy, resource development, transportation, and infrastructure. Clients are drawn to working with him because they know that by tapping into his experience, they will be able to prudently manage and effectively defend the choices they make, resources they commit, and risks to which they expose their organizations.

Ted’s extensive government experience at CEQ included the development of the National Ocean Policy, CEQ’s climate change guidance, and the regulatory response to the Deepwater Horizon disaster. He drafted NEPA guidance on mitigation and monitoring, cumulative impacts analysis, and the development categorical exclusions from detailed NEPA documentation. Ted advised the White House on the establishment of numerous national monuments, including the first marine national monuments in the United States and the largest marine protected areas in the world. He also assisted in briefing three U.S. Supreme Court cases.

Kaycee May Royer

Kaycee May Royer is an environment and natural resources associate in Perkins Coie’s Boise office and has represented clients in a wide variety of matters including constitutional and administrative litigation in federal and state courts. She has represented clients in cases involving the National Environmental Policy Act, the National Forest Management Act, the Federal Land Policy and Management Act, the Endangered Species Act, and the Clean Water Act. Kaycee’s work also includes advising municipal, industrial, agribusiness, energy, forestry, utility, and mining clients on general environmental law matters, real estate issues, permitting, regulatory compliance, construction contracting, and other matters. She is well versed in Idaho and Nevada water rights serving the needs of both industrial and mining clients in those states. Kaycee is licensed to practice law in Idaho, Nevada, and California.

Student Travel Aid Sponsored by:

Teck American Incorporated, Jentech Drilling Supply, MRC Recruiting
BEYOND CONSULTATION: Toward Collaboration with Indian Tribes in U.S. Mining and Infrastructure Projects ~ Cascade 2

**Area of Interest: Environmental**

Chaired by: Connie Rogers, Principal, Terra Law Group, Denver, CO and Collette Brown-Rodriguez, Director Community & Tribal Relations, Avantus, Tucson, AZ

**Session Description:**
This session will include perspectives from Native Americans working in or with the mining industry, along with industry representatives, to review the increasing role of Tribes, and proactive measures being undertaken by the mining industry to meet the challenges of increased attention to tribal resources in evaluation of mining projects. Specific topics include:

- **Trends in Development: Focus on ESG, Engagement and Indigenous Relations, Collette Brown-Rodriguez, Director Community & Tribal Relations, Avantus, Tucson, AZ**

- **Communicating with Tribes - Moving Past “Check the Box” Consultation Toward Mutual Understanding, Miranda Compton, Founder, Lepwe, Missoula, MT**

- **Community Benefit Agreements - What Are They and Why You Might Need One, Pilar Thomas, Partner, Quarles & Brady, Tucson, AZ**

- **Indigenous Knowledge: An Introduction and Current Issues, Connie Rogers, Principal, Terra Law Group, Denver, CO**

- **Open Forum. Join the presenters for an open discussion with the audience.**

**Connie Rogers**
Connie Rogers helps clients get their projects approved and operational. Connie advises clients in navigating complex regulatory regimes and environmental reviews, with an emphasis on compliance with federal land management statutes, the National Environmental Policy Act, species protection statutes, federal Indian law, cultural resource and religious freedom concerns, and international human rights and indigenous peoples issues. Connie’s clients include companies, local governments, non-profits and educational institutions in developing and implementing major infrastructure (water, wastewater, transmission), mining, energy (conventional and renewable) projects. Connie previously practiced in a large Rocky Mountain regional law firm, and served as Deputy Solicitor for Energy and Mineral Resources at the U.S. Department of the Interior, where she was the lead lawyer on issues relating to the development of renewable and conventional energy and mineral resources on Interior-managed lands.

Many Thanks to Kappes Cassiday & Associates and Florin Analytical Services for hosting the Burrito Breakfast
Collette Brown-Rodriguez

With 20+ years of experience as a project management & program development leader focused on tribal affairs, She has been integral to executing complex problem solving, resource management, and establishing organizational cohesion to engage tribes across North America. She has experience in uranium mine reclamation, coal, oil & gas, and base metals mining operations and project development.

Member of the Confederated Salish Kootenai Tribe and descendant of the Navajo Nation. Passionate about utilizing my multidisciplinary expertise & public speaking background to influence tribal affairs while delivering optimal business results. She holds a Bachelor’s in Environmental Science and will be completing her MBA from University of Arizona, May of 2022.

AFTERNOON SESSIONS | THURSDAY DECEMBER 8
SESSION TIMES: 2:00 - 5:30  COFFEE BREAK 3:35 - 4:20

LARGE LEFT LATERAL LEAPS TO GEOLOGIC ~ Cascade 2
Area of Interest - Mineral Deposits, Geology & Exploration

Chaired by: Curtis L. Johnson, PhD, Curtis Johnson, Senior Economic Geologist, Bronco Creek Exploration Inc., Coeur d’Alene, ID

Session Description:
This year we will work to keep the tradition of provocative talks, accentuated by “inspired” discussions and commentary from the audience alive. Maybe even pour more life into it. Of course, we will count on (un)conventional beverages to help. The session is targeting presentations at the cutting edge of exploration science and is the place for new ideas on the exploration and development of mineral projects to see the light of day.

• Benefits of Understanding Geostatistics as an Exploration Geologist, Pedro Almeida Nader, Product Specialist, Micromine Origin, Micromine, Vancouver, BC
• Think Beyond Outcrops, Andy Johnson, Retired, Butte, MT
• Toiyabe Project Near Cortez, David Browning, Vice President Exploration, Westward Gold, Vancouver, BC
• Goldfield, NV and Summitville, CO High - Sulfidation Epithermal Systems, Michael Sepp, Consulting Geologist, Anchorage, AK

(continued on next page)
Curtis Johnson received his B.S. degree in geology from the University of Idaho in 2013, his M.S. degree in geology in 2015 from Oregon State University (OSU) under Dr. John H. Dilles, and received his Ph.D. degree in 2020 with Dr. Michael W. Ressel at the University of Nevada, Reno (UNR) studying the Phoenix-Fortitude porphyry-skarn system, and regional controls on gold-rich metallogeny of the Great Basin, USA. After completing studies at OSU in 2015 and prior to joining UNR in 2017, Curtis Johnson worked in production and exploration roles for Newmont Mining Corporation in the northern Carlin Trend and at the Phoenix Mine in Nevada, USA. He is currently a Senior Economic Geologist with EMX Royalty Corporation focused on generative exploration for gold in the western USA.

SECURING MINING’S FUTURE WITH INNOVATIVE HR (PEOPLE) STRATEGIES ~ 5th Fl. Chalet Terrace

Area of Interest - Business & Finance

Chaired by: Lindsey Schultz, CEO, MRC Recruiting, Corporate Operations, Denver, CO

Session Description:
The mining industry is entering an exciting time – with topics such as a ‘super cycle’, energy independence, and electrification and decarbonization, a looming talent shortage and knowledge gap there is much to do. All of which, require people with diverse skills, experiences knowledge and approaches to solving mining’s most challenging issues. Mining companies and their leaders with support from their HR practitioners must be prepared to employ radical, innovative, and holistic/comprehensive People Strategies to tackle existing and predicted industry challenges to attract and retain a new era of diversified and included workforce within mining.

The panel will dive into HR/People solutions covering:

- Building Workforce Culture & Changing Perspectives of the Mining Industry
- Training & Development for an evolving workforce
- Recruiting & Retention Strategies
- Diversity, Equity & Inclusion programs
- Modernizing Recognition & Rewards Programs
- Psychological Safety & Its Importance in our Mining Workplaces

Panelists include:

- Yvonne Bridges, Speaker, Author, Consultant, Communiqué Consultants Ltd., Calgary, AB CANADA
- Mario Munoz, Recruitment & Outreach Coordinator, School of Mining & Mineral Reserves, University of Arizona, Tucson
• Scott Clarke, People & Culture Leader/Talent Acquisition Expert/Growth & Transformation, Oreana Gold, Salt Lake City, UT

• Patrick Portmann, Chief of Staff, Phoenix Tailings, Boston, MA

• Iris Farley, Senior Director HR, Komatsu, Chicago, IL

• Loren Pearce, Project Manager Human Resources, FLSmidth, Salt Lake City, UT

Lindsey Schultz
Lindsey has 17 years’ experience in HR and Recruiting. She is the CEO of MRC – a longstanding boutique recruiting firm focused on providing top talent to the mining industry. She holds a Bachelor of Arts degree in Human Resources and Organizational Behavior from the University of New Mexico and an MBA from Arizona State University. She has recently completed a course through Stanford University Graduate School of Business called Leveraging Diversity & Inclusion for Organizational Excellence. She is an active member in Women in Mining, AEMA, SME and number of other mining related associations. Lindsey believes MRC has the unique ability to help both clients and candidates find win-win scenarios. To create positive outcomes and networks, she has built a team of trusted partners to provide resume building and editing, professional coaching and consulting support for international candidates and clients. She advocates for and works diligently to help her clients build diverse and inclusive teams.

SITE CHARACTERIZATION – IDENTIFYING, QUANTIFYING, AND EVALUATING UNCERTAINTY ~ Cascade 1
Area of Interest - Operations

Chaired by: Scott Effner, Senior Principal Hydrogeologist, Alloy Group, Gunnison, CO and Dan Stanaway, Senior Scientist, Brown and Caldwell, Boise, ID

Session Description:
Site characterization is a complex process that involves data collection, analysis, and modeling to support feasibility studies, permitting, and closure planning for new mines. Site characterization forms the basis from which mining decisions are made and these decisions inherently contain risk. This session will focus on strategies to identify, quantify, and evaluate uncertainty related to hydrologic modeling, geochemistry, site-wide water balance evaluations, mine water and rock management, environmental compliance, and plan of operations.

• Coupling a Recharge Estimation Model with a Groundwater Flow Model to Improve Environmental Decision Support for Mining Operations, Savannah Miller, Associate Hydrogeologist, Brown and Caldwell, Lakewood, CO

• Defining the Extent of Mine-Influenced Groundwater in a Mineralized and Agricultural Area Using Multiple Lines of Evidence, Bryan McCulley, Senior Principal Hydrogeologist, Alloy Group, Lakewood, CO

• Bucktail Creek Capture System: Demonstrating Groundwater Capture in a Highly Compartmentalized Bedrock, Dave Rugh, Senior Hydrogeologist/Partner, NewFields, Missoula, MT

• Site Characterization and Predictive Modeling for a Mine Expansion Project in Nevada: Part 1, John Rupp P.G., Principal Hydrogeologist/Partner, Piteau Associates, Reno, NV

(continued on next page)
2022 Technical Session Program... (continued)

AFTERNOON SESSIONS | THURSDAY DECEMBER 8... (continued)
SESSION TIMES: 2:00 - 5:30 COFFEE BREAK 3:35 - 4:20

Site Characterization... (continued)

- Site Characterization and Predictive Modeling for a Mine Expansion Project in Nevada:
  Part 2-Geochemistry, Lisa Kirk Ph.D., P.G., Principal Geochemist/President, Enviromin, Inc., Bozeman, MT

- Comparison of Static and Kinetic Test Leachate - Which Method is Best?, Rob Bowell, Corporate Consultant, SRK Consulting, Cardiff, Wales, UK

Scott Effner

Scott Effner, P.G. is a Senior Principal Hydrogeologist for Alloy Group. He has 30 years of experience working in mining hydrogeology and geochemistry. His main areas of expertise are in the design of site characterization programs, geochemical and groundwater modeling, mine water inflow prediction, water quality monitoring, water supply evaluation, and the preparation of feasibility studies and permitting documents. Over the course of his career, Scott has provided hydrologic and geochemical consulting services to numerous projects in the western US and Latin America including mines for precious metals, copper, coal, phosphate, and industrial minerals.

Dan Stanaway

Dan Stanaway has more than 10 years of experience in water resources science and management. He is a Senior Scientist at Brown and Caldwell and manages mine permitting, water modeling, and water rights teams. Dan has overseen the development of hydrologic, water temperature, and water chemistry modeling as well as aquifer testing programs. Prior to joining Brown and Caldwell, Dan spent 5 years at the Idaho Department of Water Resources working on water rights and supply modeling and water administration. Dan has a master’s degree in hydrologic sciences and a bachelor’s degree in environmental studies and resource management from Michigan State University.

Thursday Keynote Luncheon
Noon - 1:30 ~1st Floor Celebrity Showroom

Guest Speaker Alex Jacquez
Senior Policy Advisor
White House National Economic Council

Biden-Harris Administration Strategy to Secure Reliable, Sustainable Critical Minerals Supply Chains

Sponsored by
Brown and Caldwell, Crowley Fleck PLLP,
P & C Recruiting & Small Mine Development
LARGE LEFT LATERAL LEAPS FOR ENVIRONMENTAL PROFESSIONALS - MINING AND THE GREEN ECONOMY: READY! SET! GO!
THE RACE IS ON FOR ENVIRONMENTAL SUSTAINABILITY
~ Cascade 4
Area of Interest - Environmental

Chaired by: Shawn Calendine, Geoscientist, hydroGEOPHYSICS, Inc., Tucson, AZ

Session Description:
Elements of the green economy are becoming increasingly prominent worldwide. Governments, industries, and communities are enthusiastically committing to transforming how we produce and use energy, promoting sustainability, and reducing negative environmental impacts. An essential solution for many of these challenges is green energy. However, as we focus on new and innovative green energy technologies, our ability to harness their sustainability power rests on raw materials sourced from geologic resources. As the market for raw minerals increases, demand will quickly outstrip supplies due to a sluggish regulatory environment hampered by a negative public perception of mining. How will the mining industry, the regulatory environment, and the public's often-negative opinion of mining manage the intense changes needed to respond to the heightened need for increased mineral production to support sustainable energy?

In this session, speakers will give 8-minute flash talks to pose questions for discussion in their presentation conclusions. Presenters can have as many slides as they want, but they must finish in the 8 minutes allotted.

• What is The Magic Number - Understanding Mineral Demand, Megan Zivic, Hydrogeologist, Montgomery Associates, Tucson, AZ
• Permitting & Politics, Kaitlin Sweet, Environmental Specialist, WestLand Resources, Reno, NV
• The Quest for Resources & Climate Change, Nicolette Taylor, Assistant Project Manager, Mining, Minerals & Metals, Stantec Consulting Services, Phoenix, AZ
• Building a Bridge to a Positive Public Perception, Michael Ogaz, Digital Sales Manager, Premion, Phoenix, AZ
• New Technology in Mining, Trevor Lewis, General Manager Sustainable Mining, Freeport MacMoRan, Morence, AZ

Shawn Calendine
Shawn Calendine is the Marketing & Development Manager at hydroGEOPHYSICS, a leader in the field of geophysical consulting and geosciences servicing the environmental, engineering, groundwater, mining, oil and gas, and natural-resource exploration industries. Shawn creates long-term value for hydroGEOPHYSICS by bringing a robust professional quality to the company’s marketing environment and by developing strong relationships with clients, building trust through integrity, flexibility, a deep understanding of client needs, along with decades of experience as an environmental scientist and geoscientist.
ESG AND RESPONSIBLE MINING ~ Cascade 3

Area of Interest: Legislative & Public Affairs

Chaired by: Jay Gear, Vice President Environment, Health & Safety, and Korie Hickel, Director, ESG, Community & Government Relations, Coeur Mining, Inc., Chicago, IL

Session Description:
Responsible Mining, Sustainability, and ESG are all related practices, but yet different in their own way. This inaugural session for AEMA will explore how principles of modern mining and ESG have been at the forefront of integrating mining fundamentals with society and the investment community. As ESG is defined through three broad terms, “Environmental”, “Social”, and “Governance”, the importance to showcase and disclose how mining is performed and how the mining companies conduct their business through all phases of the mine life cycle during these times are paramount to sustain a social license to operate and mission related investing, not only locally but also across a global spectrum. Plus, mining is centric to a unique role as the primary raw materials provider to support a Just Transition to a sustainable energy future.

The session will delve into navigating the complexities of ESG, through its dynamic and ever evolving nature, as well as explore policy, instituting best practices, and overcoming challenges that are unique to the mining industry.

This session will consist of both a presentation and panel block. The presentation block will cover Experience and Lessons Learned through ESG Leadership and will involve leaders showcasing their ESG efforts, experience and lessons learned through everyday aspects and their overall ESG journey. The panel block is themed The Mining Industry through an ESG Lens - Trends and Outlook, comprised of a balanced panel session to provide perspective on how ESG has transformed the mining industry and offer commentary on the ESG landscape with trends and outlook.

Block 1 - Theme: Experience and Lessons Learned Through ESG Leadership

- Earning Trust as an Environmental Steward, McKinsey Lyon, VP, External Affairs - Perpetua Resources, Boise, ID
- Getting Social with Operationalizing ESG, Heather McDowell, VP Legal, Environmental & Government Affairs, Sibanye-Stillwater, Westonaria, South Africa
- Community Level Partnerships for Meaningful Water Stewardship Impacts, Carla De Las Casas, PhD, Water Stewardship and Resilience, Brown and Caldwell, San Francisco, CA
- Coeur Mining Corporate Governance: Starting with the “G” in ESG, Casey Nault, SVP General Counsel & Chief ESG Officer, Coeur Mining, Chicago, IL

Block 2 - Theme: The Mining Industry Through an ESG Lens - Trends and Outlook

Panelists:
- Representing a Local Community's Perspective: Rusty Kiel, Manager - Lovelock Meadows Water District, Lovelock, NV
• Representing an Independent Advisory’s Firm: **Heather Keough**, Senior ESG Consultant, SASB FSA, Head of US & Canada - Leaders Arena

• Representing the Global Government’s Perspective: **Ann Carpenter**, President, CEO, Remote Energy Solutions and Lecturer at Mackay School of Mines, Reno, NV

• Representing Regional and Nevada Mining’s Perspective: **Tyre Gray**, President, Nevada Mining Association, Reno, NV

**Jay Gear**

Jay Gear joined Coeur Mining in 2014 and transitioned to the Vice President of Environment in February 2018. Gear is an accredited environmental management and science professional with over two decades of progressive experience in the mining, chemical, and consulting industries. Gear currently oversees all aspects of Coeur’s environmental efforts, which include, permitting, environmental performance, strategic planning, corporate responsibility, etc. Before joining Coeur, Jay worked in the environmental and public policy group at a molybdenum mining operation in New Mexico, in the corporate environmental remediation group for a leading chemical and ammunitions company, and in the environmental consulting field primarily with the investigation and remediation of impacted industrial sites throughout the United States, Puerto Rico, and Canada. Mr. Gear holds a Bachelor of Science degree in Watershed Management with a hydrogeology emphasis from the University of Wisconsin in Stevens Point.

**Korie Hickel**

Korie joined Coeur in 2018 and is responsible for leading ESG strategy and implementation for the company, with a strong focus on corporate ESG reporting and disclosures, cross-site alignment, stakeholder engagement and community relations. She steers Coeur’s Climate Working Group which oversees the company’s long-term strategy to assess and mitigate climate-related risks and opportunities and oversees the development of the annual ESG report. Korie sits on the Sustainability Accounting Standards Board (SASB) sector advisory group, and in 2021, was appointed to the Global Reporting Initiative’s (GRI) Mining Sector Standard Working Group, an expert project group leading the creation of a new sector reporting standard. Additionally, she is active in multiple industry ESG groups.

Throughout her career, Korie has focused on collaborating with varied stakeholder groups including indigenous communities, non-profits, government agencies and academics, identifying and implementing solutions to public health problems. Prior to Coeur, Korie worked for the Alaska Native Tribal Health Consortium, the largest and most comprehensive tribal health organization in the United States.

**Thursday Happy Hour Reception**

5:30 - 6:30 pm ~ Exhibit Hall

**Sponsored by:**

The Mining Record, O’Keefe Drilling Co., Stantec Consulting, Timberline Drilling, Inc. & Teck American Incorporated
THE CURT EVERSON GREAT BASIN EXPLORATION SESSION ~ Cascade 2

Area of Interest - Mineral Deposits, Geology & Exploration

Chaired by: Chad Peters, P.Geo, President, CEO & Director, Ridgeline Minerals, Winnemucca, NV and
Bob Felder, Director, Orogen Royalties, Reno, NV

Session Description:
Nevada and the Great Basin continue to be a top jurisdiction for exploration and mining investment, due to the rich mineral endowment, extensive infrastructure and favorable regulatory process. The area remains a busy arena of competition among major and junior companies, as evidenced by significant resource expansion among the majors and a large number of newly listed junior companies raising capital and exploring for a variety of commodities. Competition for claim stakers, soil samplers, geophysical contractors, drill rigs and geologists is very high. Amidst all of this, there are companies doing high-quality geologic work advancing existing projects and in search of new discoveries. This year’s session will focus on exploration to resource stage projects with an emphasis on geologic innovation, breakthroughs and successes.

- The Santa Fe Project: A Phoenix Rises in the Walker Lane, Tony Gesualdo, Exploration Manager, Lahontan Gold Corp., Reno, NV
- The Gooseberry Mine, Storey County Nevada: New Exploration in an Old District, Eric Saderholm, President/Director, American Pacific Mining Co., Elko, NV
- Exploration of Carlin-type and CRD Mineralization in the Ruby Hill District, Eurika County, Nevada, Tyler Hill, Senior Geologist, i-80 Gold Corp., Reno, NV
- Exploration at the Mercur Mine in 2022: Ensign Minerals Breathes New Life into a Carlin-type District Shuttered for 25 Years, Butch Wulftange, Vice President Exploration, Ensign Minerals, Reno, NV
- Exploring Reyna Silver’s Medicine Springs CRD Project in Elko County, Nevada, Lauren Megaw, Investor Relations, Reyna Minerals, Bingen, WA

Chad Peters
Chad is a registered professional geologist and the President, CEO and co-founder of Ridgeline Minerals, a Nevada focused junior explorer. Chad and his team have raised $14 million in the public markets since 2019 as well completed an IPO on the TSX Venture in 2020. Prior to co-founding Ridgeline Minerals, Chad was a managing member of the Premier Gold Mines Ltd. Exploration team responsible for the discovery of over 10 Moz. of gold in Canada and the US.
Bob Felder

Bob Felder is a Director of Orogen Royalties Inc. following the successful merger of Renaissance Gold and Evrim Resources in 2020. Bob has worked on the exploration side of the mining industry for most of the past 40 years, beginning in technical positions as an exploration geologist, and progressing into management and executive roles, for both major and junior companies. He has been involved in the discovery and resource development of several projects in Nevada which have subsequently become mines, and through that experience has become very well versed in all aspects of mineral exploration and development.

Bob is active in the Nevada geologic community and currently serves on the Nevada Minerals Commission, as a Director of the Geological Society of Nevada (GSN) Foundation and as a Vice President of the Nevada Chapter of The American Institute of Professional Geologists (AIPG).

GUIDELINES FOR REPORTING EXPLORATION RESULTS, MINERAL RESOURCES, AND RESERVES: AN OVERVIEW ~ Cascade 5

Area of Interest - Business & Finance

Chaired By: Abani R. Samal, Ph.D, CPG, RM- SME, Fellow-SEG, Principal, GeoGlobal LLC, Salt Lake City, UT

Session Description:
With the increase in the demand for various minerals, exploration activities and the development of mining projects have increased in various parts of the world. This leads to fundraising activities through public participation and public reporting of exploration results, mineral resources, and reserves. Recently, the resource reserve reporting codes and guidelines have gone through major revisions in order to safeguard the interests of the stakeholders. In this session, the presentations will discuss the technical, legal, and community engagement aspects of the resource and reserve reporting guidelines.

• Reporting Guidelines: A Summary of all Guidelines Particularly Taking the Commonality between JORC, SK1300, and NI-43 101, Peter Christensen, Principal, RESPEC, Denver, CO

• Update on Regulation 1300 after the First Year of Public Disclosure. We will discuss the SEC’s comments on S-K 1300 disclosure and the frequent challenges faced by issuers when preparing their S-K 1300 disclosure, Kimberly R. Anderson, Partner, Dorsey & Whitney LLP, Seattle, WA

• How General Mining Package Software can be Leveraged to Generate the Content Used in the S-K 1300 Technical Reports, Maureen Moore-Roth, Technical Services Manager & Training Lead, and Ben Turner, Maptek, Denver, CO

• Materiality Transparency Competency: Three Pillars of Public Reporting, Abani Samal, Principal, GeoGlobal, Salt Lake City, UT

CLE Credits Pending

(continued on next page)
Abani Samal

Dr. Abani Samal has a wealth of knowledge and experience in the field of economic geology and valuation of mineral resources. He has extensive training (MS and PhD) in economic geology and geostatistics. He is also well recognized for his expertise in advanced geostatistics and mineral resource estimation. He is proficient in English and Odia. Dr. Samal has both industry and academic teaching experience which uniquely qualifies him to deliver this training program. In last 20 years in industry, he has gained experience in various commodities including iron ore, Cu-Mo-Au, Au-Ag, Pb-Zn-Ag deposits around the world. His outstanding contributions to the industry are well recognized through his publications and presentations of his research and findings in various national and international conferences. Dr. Samal is a registered member of SME (RM-SME), a certified professional geologist (CPG) and a Fellow of the Society for Economic Geologists (SEG). Dr. Samal is a qualified person as per international resource reserve reporting standards such as JORC (Australia) and NI-43-101 (Canada). Dr Samal is also an honorary member of CRIRSCO. Dr. Samal has offered many short courses in public domain and also on site projects. Dr. Samal is known for delivering difficult and challenging topics in simple language to make it more meaningful.

ARTIFICIAL INTELLIGENCE & DATA ANALYTICS APPLICATIONS IN MINING OPERATIONS ~ Cascade 4

Area of Interest - Operations

Chaired by: Javad Sattarvand, Ph.D., Associate Professor, University of Nevada, Reno and Ali Soofastaei, Ph.D., Artificial Intelligence Projects Leader, Vale-Australia-Brisbane, Brisbane, QLD, AUSTRALIA

Session Description:
The mining industry is increasingly using AI to optimize processes, enhance decision-making, derive value from data, and improve safety. While there are many benefits to its implementation, it is still very new, and there is much work that needs to go into a successful application. Planning, research, communication, and change management are all essential foundations for implementation. In an industry that can be reluctant to change, industry collaboration is essential to communicate the advantages of AI and establish best practices for AI technology.

The AI in Mining session will focus on AI & Data Analytics applications in the mining industry. During this session, the industries and universities will collaborate on the future of AI from a wide range of perspectives. The session so their paper will be a fit. It also goes a long way in selling your session to the attendees.

• The Application of AI to Reduce the Mine Material Transportation with the Help of Vessel Chartering Cost Prediction, Ali Soofastaei, AI Program Leader, Vale, Brisbane, Australia.
• Data Driven Decision Making Through Industrial Digital Transformation, Brian Fitch, Business Systems Manager, Barr Engineering Co., Minneapolis, MN

• Using 3D Machine Vision Artificial Intelligence System and Edge Computing to Optimize the Mine-to-Mill Performance, Ravi Sahu, Founder & CEO, Strayos, Buffalo, NY

• Automation Isn’t ‘All or Nothing’; A Practical Example of Incremental Automation in Drilling, Derek Cooper, Managing Director, Hexagon, Vancouver, BC CANADA

• Mining Engineering Education in the Era of Digital Transformation and Artificial Intelligence, Javad Sattarvand, Department Chair, University of Nevada, Reno

Javad Sattarvand

Dr. Javad Sattarvand, Ph.D., is an associate professor at the Department of Mining and Metallurgical Engineering, at the University of Nevada, Reno since 2015. Dr. Sattarvand has received his Ph.D. in Mining Engineering from the University of Rheinisch-Westfälische Technische Hochschule Aachen – Germany in 2009. With 17 years of academic appointments as a lecturer, Assistant Professor and Associate Professor in the USA, Germany, Netherlands, and Iran and supervising 34 masters and 3 Ph.D. students, he is the teacher for mining automation and mining robotics courses at the University of Nevada, Reno.

Dr. Sattarvand has published 26 journal and over 70 conference papers and has received over three million dollars of federal grants, mostly from NIOSH. He has been also the recipient of the prestigious SME’s career development grant ($300K). Dr. Sattarvand’s industrial expertise is in mine planning, optimization algorithms, and programming for different mining applications, mine monitoring, and mine control systems. He has founded two start-up companies and his cooperation with major global consulting companies resulted in more than 20 industrial projects and the commercialization of several software and hardware products for mining automation.

Ali Soofastaei

Dr. Ali Soofastaei is an artificial intelligence scientist and an industrial global project leader. He leads innovative industrial projects in the field of artificial intelligence (AI) applications to improve safety, productivity, and energy efficiency, and to reduce maintenance costs. Dr. Soofastaei completed his Ph.D. at The University of Queensland (UQ) in the field of AI applications in mining engineering where he led a revolution in the use of deep learning (DL) and AI methods to increase energy efficiency, reduce operation and maintenance costs, and reduce greenhouse gas emissions in surface mines. Currently he is leading an AI Program in Vale.

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MINE CLOSURE AND RECLAMATION ~ Cascade 1

Area of Interest: Environmental

Chaired by: Nick Rauh, Mining Technical Sales Manager, AGRU America, Inc., Fernley, NV and Steve Boyce PE, Nevada Mining Practice Leader, Haley & Aldrich, Inc., Elko, NV

Session Description:
Mine closure is a critical component of environmental management in the mining industry. A thorough mine closure and reclamation plan is a complicated and often overlooked aspect in the design life of a site. This session will include technical presentations and case studies on the closure and reclamation process from shut down to post-closure monitoring by mining professionals across the industry.

- Bridging CERCLA Requirements and Closure Guidelines to Streamline Closure Planning, Kevin Lundmark, Principal Consultant, Scientist, ERM Salt Lake City, UT
- Resolving Operational Water Challenges at a Remote Legacy Mine, Dale Kolstad, Senior Environmental Engineer/Vice President, Barr Engineering Co., Minneapolis, MN
- Quantifying the Influence of Climate Data Substitutions for Evapotranspiration Cover Design, Kelly Greaser, Senior Associate, Hydrogeologist, Stantec Consulting Services, Inc., Denver, CO
- Stabilization of Potentially Acid Generating Tailings, David Tooke, Senior Geochemist, NewFields Mining and Energy Services, Golden, CO

Nick Rauh
Nick Rauh is the Mining Sales Manager for AGRU America, Inc. in Reno, Nevada. Before taking over the Mining Division, Nick served as the Technical Manager for the Western and Central United States for AGRU. Prior to working on the manufacturing side, he served as a project engineer for a geosynthetic installation contractor for a number of years. Nick received a BS in Civil Engineering from the University of Nevada, Reno.

Steve Boyce
Steve Boyce is a professional Civil Engineer and Nevada Mining Practice Leader for Haley and Aldrich, Inc. Steve graduated with an MS in Civil Engineering and an MBA from the University of Nevada. He has been active in the mining industry in Nevada, North America, and globally for over 30 years, performing roles in the regulatory, operations, and consulting arenas over that time. He has been completing and facilitating mine closure since 1997 and as a lifetime Nevada resident enjoys free time in the Nevada and Idaho outdoors.
WE CAN SECURE OUR SUPPLY CHAINS, BUT WILL THEY LET US? ~ Cascade 3

Area of Interest: Legislative & Public Affairs

Chaired by: Mark Compton, Executive Director, American Exploration & Mining Association, Spokane Valley, WA

Session Description:
The Biden administration has very clear priorities, including addressing climate change through renewable energy and vehicle electrification, rebuilding infrastructure, and highlighting environmental justice issues. Geopolitical events and global mineral demand clearly demonstrate the need to establish secure mineral supply chains for our economic and national security. This session will explore actions taken by the administration and Congress to help and/or hinder our quest to build and maintain a strong domestic mining industry to safely and responsibly provide the minerals society requires, as well as a look forward to what we can expect in 2023.

- The Impact of Rhetoric on Process, Kris Benusa, Manager – Environmental Studies, Twin Metals Minnesota, Ely, MN
- Thacker Pass Lithium Project - Moving Toward Construction Execution, Tim Crowley, Vice President, Government & Community Relations, Lithium Americas, Vancouver, CANADA
- Transforming our Supply Chains: an AND versus OR Conversation, Susan Lascek-Ki-Coir, Consulting Director Sustainable Supply Chains, ERM, Fairport, NY

Mark Compton

Mark rejoined AEMA after serving six years as the Utah Mining Association’s (UMA) President. Having worked for AEMA, then known as the Northwest Mining Association, from 2008-2012 as the Government Affairs Manager, he already possesses an organic familiarity with the Association, its membership, and the issues.

Additionally, Mark possesses over a quarter century of government affairs experience. Prior to his tenure at UMA, he served as AEMA’s Government Affairs Manager and worked as a member of Idaho Governor C.L. “Butch” Otter’s gubernatorial and congressional staff, where he handled issues focusing on natural resources and economic development in northern Idaho.

He has a profound appreciation for the importance of responsible resource development to our economy and our way of life. He believes that by working together, AEMA and its members can ensure the U.S. mining industry remains strong and is able to produce the raw materials on which our modern society depends.

A graduate of the University of Montana, Mark lives with his wife Kelley on the outskirts of Coeur d’Alene, ID.
Student Poster Contest
Set up: Tuesday, December 6th from 8:00 a.m. - 5:00 p.m.
Judging: The morning of Wednesday, December 7th
Prizes: During the Student and Early Career Professionals Luncheon

Student & Early Career Professionals Reception
Wednesday, December 7th from 6:30 - 7:30 p.m.
Sponsored by: SRK Consulting (US), Inc., Perpetua Resources and Teck American Incorporated

Student & Early Career Professionals Session
Thursday, December 8th from 8:00 - 11:30 a.m.

Student & Early Career Professionals Luncheon & Poster Awards
Thursday, December 8th from 12:00 - 1:30 p.m.
Sponsored by: Teck American Incorporated
CONTEST DESCRIPTION

The contest is structured to simulate the presentation of a project or process to management by an engineer, geologist or metallurgist. The candidate will be judged on his/her ability to convey meaning and conviction that the work is significant and is of benefit to the minerals industry.

PRIZES TO BE AWARDED

- **Grand Prize ~ $350** - Check donated by Sponsors of the 2022 AEMA Annual Meeting
- **2nd Prize ~ $200** - Check donated by Sponsors of the 2022 AEMA Annual Meeting
- **3rd Prize ~ $150** - Check donated by Sponsors of the 2022 AEMA Annual Meeting
- **4th Prize ~ $100** - Check donated by Sponsors of the 2022 AEMA Annual Meeting
- **5th Prize ~ $75** - Check donated by Sponsors of the 2022 AEMA Annual Meeting

Participating Students:

- **U/Pb Geochronology and Zircon Trace Element Geochemistry of the Pembine-Wausau Terrane of the Proterozoic Penokean Orogen, Wisconsin, Evan Weber, University of Wisconsin-Eau Claire**
- **Defining Volcanic Stratigraphy and Syn-volcanic Intrusions at the Lynne Zn-Pb-Cu Deposit, Wisconsin, USA, Lillien Glodowski, University of Wisconsin-Eau Claire**
- **Assessing the Environmental Footprint of Rare Earth Elements Recovery from Coal Coarse Refuse, Mohsen Rabbani, University of Nevada, Reno**
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#### 111
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#### 115
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#### 117 and 119
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#### 123
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#### 125
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#### 127
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#### 129
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#### 133
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#### 205
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#### 207 and 209
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#### 208
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#### 210
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#### 210 B
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#### 211
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#### 212
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#### 213
- **Zonge International, Inc., Geophysical Services, Geophysical Instrumentation**

#### 214
- **SWCA, Environmental Consulting**

#### 215
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#### 217
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#### 218
- **Parsons Behle & Latimer, Legal Services**

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#### 222 and 224
- **Stantec Consulting Services, Environmental Consultants,**

#### 223 and 225
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#### 226
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#### 227
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#### 229
- **Acker Drill Company, Drilling Equipment, Drilling Rigs**

#### 231
- **ASC Engineered Services, Grooved Piping Products**

#### 232
- **Mill Man Steel Inc. and Mavrik Environmental & Exploration, Steel Fabrication, Drilling Products**

#### 233
- **Alaska Marine Lines, Inc., Transportation Services**

#### 235
- **Northwest Machine Works, Inc., Drilling Products, Underground Core Drilling Parts**

#### 237
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#### 239
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303 SkyTEM Canada Inc., Airborne Geophysical Services

304 International Lining Technology, Liner Installation, Geosynthetics

305 Big Rock Exploration, Mineral Exploration

306 Pioneer Technical Services, Inc., Engineering and Environmental Consultants

307 Pace Analytical Services Inc., Laboratory Services, Environmental Laboratory Services

308 CleanTech Environmental, Environmental Services

309 CGS Mule, LLC, Geological Supplies

310 REI Drilling/DPI Drilling Products, Drilling Services, Drilling Supplies

312 Dias Geophysical, Geophysical Services

313 Nevada Bureau of Mines & Geology, Geological Survey

314 Geo-Logic Associates, Engineering Consultants

315 CREG (Center for Research Economic Geology), Research

316 SVL Analytical, Inc., Analytical Services

317 Mackay School of Earth Sciences & Engineering, Educational / University,

318 Geological Society of Nevada (GSN), Books & Publications

319 Nevada Division of Minerals, Information of Geology & Mining in Nevada

322 Energy Laboratories, Inc., Environmental Laboratory Services

323 and 325 RockTech USA, Drilling Products, Drill Hole Survey

324 MES Mining, Underground Mining Contractor, Tunneling

326 Engineering Analytics, Inc., Engineering Consultants

327 Hecla Mining Company, Mining Company

328 DGI Geoscience US Inc., Wireline Logging

329 United Central Industrial Supply, Cap Lamps, Gas Detection, Mine Rescue, Ventilation Products, Services

330 Harrison Western Construction Corporation, Contract Mining, Underground Construction

332 Hexagon Mining, Mine Modeling Software, Mine Software

333 Ruen Drilling, Inc., Drilling Company

334 Cornell Pump Company, Pumps

335 MTech/CAMP, University, Metallurgical Consulting

336 Wilderness Medics, Inc., Medical Services

337 and 339 EDCON-PRJ, Inc., Geophysical Services

338 Costmine, Mine Information, Cost Estimating Services

400’s

402 Solmax Geosynthetics LLC, Geosynthetics, Liners

403 and 405 Mount Sopris Instrument Company Inc./AXIS, Geophysical Logging Equipment,

404 Millcreek Engineering, Engineers

406 EnviroTech Services, Inc., Liners

407 Pacific Inter-Mountain Distributon, LLC, Erosion Control Products

408 Women’s Mining Coalition, Education/Governmental Affairs, Public Affairs/Grassroots
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409 EC Applications, Inc., Geosynthetics
412 MICROMINE, Intuitive Mining Solutions
413 and 415 Drilling HQ, Diamond Core Supplies
414 and 416 IMDEX Limited, Drilling Fluids & Solids Control, Down Hole Survey/XRF Rentals
417 Linkan Engineering, Water Management
418 Society for Mining, Metallurgy & Exploration, Inc. (SME)/MEC, Professional Association
419 Western Environmental Testing Laboratory, Environmental Laboratory Services
422 Veolia Water Solutions & Technologies, Water Treatment
423 hydroGEOPHYSICS, Inc., Geophysical Services
424 ESI Liners, Geosynthetics, Liner Installation
425 Engineering & Mining Journal, Mining Publications
426 Iron Woman Construction & Environmental Services LLC, Mine Construction
427 and 429 Foth Infrastructure & Environment, LLC, Environmental Engineering
428 ARCADIS, Environmental Consultants, Engineering Services
432 Foremost, Drilling Products
433 Sample Archive System, Core Boxes
434 American Institute of Professional Geologists, Professional Association
435 Hidden Valley Insurance Inc., Insurance Services, Insurance & Risk Management
436 Klepfer Mining Services, LLC, Environmental Services
437 and 439 O’Keefe Drilling, Drilling Company
438 Welsh Hagen Associates, Environmental Engineers

500’s

502 Bison Engineering Inc., Environmental Consulting/Permitting, Environmental Services
504 Precision Geosurveys Inc., Airborne Geophysics
506 ICF, Environmental Consulting
511 Datamine North America, Mining Software
512 Northwest Linings and Geotextile Products, Inc/Sierra Geosynthetic Services, Inc., Liner Installation, Geosynthetics
513 Premier Drilling, Drilling Company
514 Western Nevada Supply, Commercial Supply House
516 Paragon Geochemical Laboratories, Inc., Analytical Laboratory
517 Imperial Pipe, Steel Pipe
518 Wood Rodgers, Surveying, Aerial Mapping
519 Yellow Jacket Drilling Services, Drilling Company
522 McClelland Laboratories, Inc., Analytical Laboratory
524 EMX Royalty Corp., Mining Company
525 HOLT Services inc., Dewatering Wells, Environmental Drilling
526 Piteau and Associates, Engineering and Environmental Consultants
527 Geotic, Inc., Core Logging Software
528 Nexus Environmental Consultants, Inc., Environmental Consultants

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531 Legarza Exploration, Exploration Pads and Roads
532 Inland Tarp & Liner, Liners
533 Evoqua Water Technologies, Water Treatment
534 Authentic Drilling, Inc., Drilling Company
535 Custom Linings, Liners
536 Brewer Exploration, Geologic Consulting
537 and 539 Perpetua Resources, Junior Exploration Company
538 Itasca Denver, Inc., Hydrology, Geomechanics & Geochemistry Consulting, Environmental Consulting & Permitting

600’s

638 Skyline Assayers & Laboratories, Assay Laboratory, Laboratory Analytical Services
640 DEA Incorporated/KonNx, Electrical Distribution Equipment
642 Eastern Driller Mfg. Co., Inc., DTH Hammers & Bits
643 GEOKON, Geophysical Instrumentation
644 Cementation USA Inc., Mine Construction
647 TechLine Alaska, Drilling Supplies
648 and 650 McGinley & Associates, Environmental Consultants
649 Terramac, Crawler Carriers
652 OCED - US Department of Energy, Government Agency
653 ENSERO, Water Treatment, Reclamation
654 Resource West, Evaporation Equipment, Mine Ventilation Equipment
655 Harris Exploration Drilling, Drilling Company

658 ProDeMin/Prismo Metals, Mining Company
659 and 661 Esri, GIS, Location Analytics
664 SLR Consulting, Environmental Consultants
667 Redpath USA Corporation, Contract Mining
671 Guy Nielsen Refractory Contractors, Refractory Contractors
673 Axter Coletanche, Geomembranes
674 Forage FTE Drilling, Drilling Company

700’s

700 American Assay Laboratory, Assay Laboratory, Mineralogy Analyzer
702 Layne Christensen Company, Drilling Services
704 Tetra Tech, Engineering Consultants, Environmental Consultants
708 and 710 Boart Longyear, Drilling Services, Drilling Company
712 Westland Resources, Environmental Consulting & Permitting
718 and 720 Baroid Industrial Drilling Products, Drilling Fluid Products
719 and 721 The Mining Record, Mining Publications, Maps
722 Knight Piesold, Consulting Engineers, Environmental Consulting & Permitting
723 Skyward Specialty Insurance Group, Insurance Services
724 Hole Products, Drilling Supplies
726 Legend, Inc., Geological Supplies, Assay Supplies
727 WaterSolve, LLC, Dewatering
729 Contech Engineered Solutions LLC, Pipe, Erosion Control Products
730 and 732 National EWP, Drilling Company
731 Utah Mining Association, Mining Association
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734 Agilent Technologies, Atomic Spectroscopy, Laboratory Equipment
739 Bureau Veritas Minerals, Assay Laboratory
741 Analytik Jena US LLC, Spectroscopy
742 EcoMister Evaporator, Dewatering Evaporator
743 RESPEC (MDA), Mining Software
744 Colorado School of Mines, Educational/University, Metallurgy/Mining Departments
746 U. S. Geological Survey, Government
747 Montgomery & Associates, Engineering
748 Concrete Canvas, Concrete Coverings
749 SGS, Analytical Laboratory Services, Metallurgical Consulting
752 Falcon Drilling Inc., Drilling Company
753 Tsurumi (America), Inc., Pumps
754 Valley Science and Engineering, Water Management, Environmental Services
755 Disa Technologies, Inc., Materials Liberation Technologies
758 Alaska Department of Natural Resources, Government
759 Alloy Group, Environmental Engineers
761 SPECTRO Analytical Instruments, Inc., Materials Analysis
764 and 766 Xylem, Pumps
765 ENERGOLD, Drilling Company
767 Komatsu, Mining Equipment
770 Zitron USA, Mine Ventilation
773 Odin, Mine Construction
774ioneer USA Corporation, Mining Company
775 Hard Rock Consulting, LLC, Geologic Consultants, Engineering Consultants

800’s
822 and 824 Barr Engineering Co., Engineers
830 OREAS North America Inc., Certified Reference Materials
832 Environco, Inc., Environmental and Reclamation Services
834 American Lithium, Lithium Company
836 Major Drilling, Drilling Company
838 Forgen, Environmental Remediation
840 and 842 U. S. Forest Service, Government
844 SciAps, Inc., Hand Held Spectrometer
846 Nilex, Liners, Pipe
848 Geotek, Ltd, Core Log Analysis
852 WEG Electric, Electrical Control Distribution Systems
854 CASCADE, Drilling Company, Geotechnical Drilling
858 Stockholm Precision Tools, LLC, Downhole Surveying Instruments
860 Garmin International, Satellite Communications, Handheld GPS & GPS Wearables
864 and 866 National Mine Map Repository, Mine Maps
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872 CDN Resource Laboratories, Certified Reference Materials
874 Kiewit Industrial Group, Construction, Engineering
877 Water & Environmental Technologies, Environmental Services

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C 2  Arizona Silver, Junior Exploration Company

C 3  Silver Range Resources, Junior Exploration Company

C 4  Orogen Royalties, Inc., Royalty Company

C 5  Headwater Gold USA, Junior Exploration Company

C 6  Comstock Mining, Mining Company

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C 9  Pan American Energy, Junior Exploration Company

C 10  i-80 Gold Corp., Mining Company

C 12  Relevant Gold Corp., Junior Exploration Company

C 13  W R H Nevada Properties LLC, Junior Exploration Company

C 14  Gold Royalty (Ely Gold Royalties), Royalty Company

C 15  Aston Bay Holdings, Junior Exploration Company
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