



GEOLOGICAL SOCIETY OF NEVADA NEWSLETTER

Geological Society of Nevada, 2175 Raggio Parkway, Room 107, Reno, NV 89512
(775) 323-3500 - Hours Monday -- Friday, 9 a.m. to 4 p.m.
Website: www.gsnv.org • E-mail: gsn@gsnv.org



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**MARCH 4, 2021
THURSDAY
Via Zoom**

GSN SO. NEVADA CHAPTER MEETING

The GSN Southern Nevada Chapter Meeting will be held on Thur., March 4th at 5:45 pm. **Speaker: Dr. Simon Jowitt, UNLV Professor.** Title: "Climate change and mining or how mining will save the world; why the minerals industry will be a vital part of the transition to a low-CO2 future". For questions, please contact President Josh Bonde at: joshua.bonde@nvscicenter.org. Abstract on page 6.

**MARCH 10, 2021
WEDNESDAY
Via Zoom**

GSN WINNEMUCCA CHAPTER MEETING

The Winnemucca Chapter Meeting will be hosting their virtual meeting on Wednesday, March 10th at 7:00 p.m. **Speaker is Greg Dering, Headwater Gold.** His title is: "Precious Metal Potential in the Owyhee Epithermal Belt, Southeast Oregon and Southwest Idaho: Examples from the Katey and Mahogany Projects". For questions, please contact President Chad Peters at: cpeters@ridgeline minerals.com. Abstract on page 7.

NO Elko March Meeting

GSN ELKO CHAPTER—No Meeting this month

The GSN Elko Chapter will not be having a scheduled presenter during March but we will be making up for it in April with a speaker double-header! The April dates, speakers and titles can be found on page 8. Please contact Elko President Justin Milliard: justin.b.milliard@gmail.com for more information.

**MARCH 19, 2021
FRIDAY
Via Zoom**

GSN REGULAR MEMBERSHIP ZOOM MEETING

The GSN's March meeting will be held via Zoom on Friday, March 19th beginning at 6:15 pm for chatting. Talk begins at 6:30 p.m. **Guest Speaker: Stan Keith, MagmaChem.** Title: "Yellow Gold and Black Gold in the Great Basin: a Magma-Metal Series Approach". Please contact Laura Ruud at the GSN office if you have any questions: gsn@gsnv.org. See page 3 for abstract and Zoom meeting join-in information!

**MARCH 25, 2021
THURSDAY
Via Zoom**

GSN SYMPOSIUM 2021 ZOOM LECTURE SERIES

The GSN 2021 Symposium lecture will be held on Thur., March 25th via Zoom beginning at 7:00 p.m. PST. **Speaker: Richard Reid.** Title: "History of the Modern Gold Rush in Nevada". See Abstract and Zoom Login information on page 10. Contact Technical Chairs, Mike Ressel or Molly Hunsaker for more info. mikeressel@sbcglobal.net or mollymariehunsaker@gmail.com



FROM THE PRESIDENT
Mary Stollenwerk, GSN President 2020-2021
MARCH 2021



The Monthly Membership Meetings continued into 2021 with a talk by Dr. Zhoashan Chang on Skarns and this month Stan Keith of MagmaChem will be the speaker.

- See update on Symposium on page 13.
- For Chapter activities, see page 6 for Southern NV, page 7 for Winnemucca and page 8 for Elko.
- Stay tuned for an announcement of a Spring Field Trip in the coming months. Prepare to camp again!

With the promise of in-person events come fall, please consider serving on the committee of your local Chapter! Each Chapter (Elko, Winnemucca, and Las Vegas) is taking nominations for officers now.

I'm certainly having a harder time than normal with cabin fever this year, which I think makes this monthly missive difficult to find a theme. I don't have any insight on dropping gold prices, so I will leave that subject to other pundits. I don't have any secret source for getting the Covid Vaccines, but I do have faith the delivery is escalating. With PDAC coming up on March 8th, we are all reminded of the last time many of us got to be out and about. If you are attending virtually, be sure to drop in on Laura and the rest of the gang in the "Nevada" Booth. Laura will be joined by reps from NDOM, BLM, NMEC, NVMA, NBMG, GOED and NNRDA.

I did drop in at the Nevada Museum of Art last week, and am looking forward to the new exhibit coming next week called "The Victorian Radicals". Of course, capacity is limited, masks are required (I wore my GSN mask), and the café was closed. With daytime temperatures in the 50's each day on this side of the state, I am looking forward to de-winterizing our camper and getting out again. I think early spring will be a great time to visit some of the State Parks in the southern part of our state before it reaches summer temperatures.



**Valley of Fire State Park,
November 2020.**

Photo Credit: Laura Ruud



**Last Supper Sculpture. Goldwell
Open Air Museum, Rhyolite, Nevada**

GSN Virtual Talk: FRIDAY, MARCH 19, 2021

Zoom Opens @ 6:15 PM, Talk begins @ 6:30 PM (Pacific)

(Zoom meeting details can be found below.)



Guest Speaker: Stan Keith, MagmaChem

**Title: “Yellow Gold and Black Gold in the Great Basin:
a Magma-Metal Series Approach”**

Date/Time: March 19, 2021 at 6:15 PM Pacific Time (US and Canada)

Join Zoom Meeting:

<https://us02web.zoom.us/j/84854551546?pwd=bUJzYnd4S2RrVmN2Z2hON3psOTIhUT09>

Meeting ID: 848 5455 1546 Passcode: Magma

One tap mobile: +16699006833,,84854551546#,,, *182554# US (San Jose)

Dial by your location: +1 669 900 6833 US (San Jose)

Meeting ID: 848 5455 1546 Passcode: 182554

ABSTRACT:

Yellow Gold and Black Gold in the Great Basin: a Magma-Metal Series Approach

by Stanley B. Keith, Jan Rasmussen, Monte Swan, and Troy Tittlemier

Nevada is notorious for its gold cluster centered near Carlin, Nevada. Aficionados of the resource geology in this part of the world know the black gold (oil and hydrocarbons) is also a well known denizen of this region. The economic dominance of the yellow gold makes it tempting to consider northeast Nevada as a gold province. The concept of a northeast Nevada gold province in its regional context however is a major oversimplification. Considered in a more regional geographic and especially temporal context, northeast Nevada is more notable for its highly variable and heterogeneous resource geology in space and time (see the Nevada Test site region magma-metal series map in Rasmussen and Keith, 2015). Nevertheless, there is no question that northern Nevada for both yellow and black gold has a clustered distribution of gold and petroleum. Comparison to other areas such as SE Arizona reveals contrasts such as a highly economic cluster of economic copper deposits and no notable gold or petroleum clusters. Why is this??

Application of the Magma-metal series approach (Keith and others, 1991; Keith and Swan 1996; Rasmussen and Keith, 2015) reveals a possible answer: crustal oxidation state. In oxidized crusts, oxidation states of average plutonic ferri:ferrous ratios are above 0.9, and early magmatic magnetite-sphene assemblage is present. Hydrothermal porphyry copper deposits (Morenci-Chuquicamata Type) are present in the case of oxidized hydrous calc-alkalic metaluminous intrusions. In areas where plutonic oxidation states are less than 0.9 (and especially less than 0.6), early magmatic ilmenite is present. Correspondingly, hydrothermal porphyry gold deposits (Carlin-Porgera Type) are present in the case of reduced hydrous calc-alkalic metaluminous intrusions (Figure 1). Aqueous chloride complexing is probably the main hydrothermal (cont. page 16)

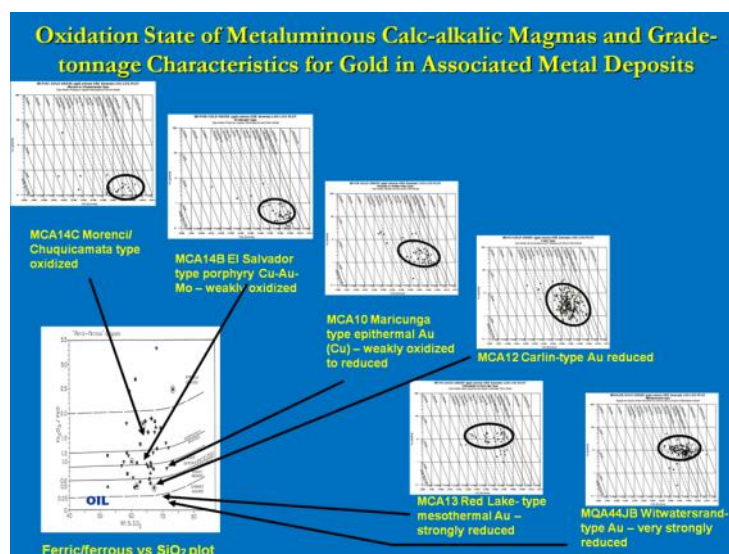


Figure 1. Relationship between plutonic oxidation state and gold grades of spatially associated gold deposits.

“Face of GSN”

PATRICK QUILLEN

Reno, Nevada



Who doesn't love core logging?

If memory serves, I failed my first mineralogy hand-sample ID test. In my defense I was a junior in High School and there were several fragments of non-minerals included to throw students off. I had also neglected to memorize Mohs hardness scale, which we were required to do. Thinking back on that “Earth and Space Science” class, it was the first time that I had entertained the idea of pursuing geology as a career. I owe a great deal of thanks to Mr. Bergstedt (a geologist himself), whose dry humor and blunt, skeptical style of teaching captivated me. I initially took the class due to my love of the cosmos, but realized that geology presented more practical applications, where I could turn my interest in science into a real-world job. I also realized that my terrible eyesight and susceptibility to motion sickness, among many other factors, would likely prevent me from becoming a pilot and astronaut.

I probably always had an interest in rocks and geology, even if I didn't

realize it. While growing up around Duluth Minnesota, the north shore of Lake Superior, and the Iron Range, I was exposed to more outcrop and mining than many Midwesterners. I recall roaming the land around our house digging through rock piles placed there by farmers and pondering at the intricate textures and overall variety of rocks, while wondering where they came from. It is now obvious those rocks were glacially transported from around the Precambrian shield, and many of them still make up dust collectors around my parents' house. The seeds of curiosity were also likely planted during a trip to Alaska at the age of 16, which was the first time I recall seeing mountains and gold. I still remember being awed as I looked out the plane window to see glaciers, and how different it was from the terrain I was used to.



Cousins, brother, myself (yellow hat) and Aunt near the Hatcher Pass historic gold mine in Alaska. Circa 2007, before I knew anything about mountains, gold or mining.



Obligatory field camp picture. There are worse places than Park City to have field camp based out of.

During undergrad at the University of Minnesota-Duluth (UMD) I was first exposed to economic geology, participating in the local SEG student chapter under the guidance of the great Dr. Jim Miller, who encouraged and motivated me to pursue the world of mineral exploration. The comradery and variety of field trips I experienced while at UMD and within the geology community solidified my desire to pursue geology further. This led me to the University of Nevada-Reno (UNR), where I completed a master's thesis under the guidance of Dr. John Muntean, whose unrestrained passion for ore deposits and hydrothermal fluids is genuinely an inspiration. In fact, my first trip to Reno (continued on page 5)

Quillen Faces (cont. from page 4)

was in 2014 to visit UNR as a prospective student, which happened to coincide with a GSN meeting night. I was taken aback by the number of geos in one room, not to mention the free beer, which had me very excited to continue my education in Reno. While at UNR my knowledge and appreciation of ore deposits and their processes grew by orders of magnitude, and I was grateful for the opportunity to take field trips to places like central Mexico and be so close to many industry members and so much world-class geology. I suppose I would also be remiss if I didn't mention that during my first full summer in Nevada I experienced what can only be described as a rude awakening to the realities of life in the desert, when a flash flood entrained my field truck that I left back at camp. I had to hike to cell coverage and call Richard Bedell and Eric Struhsacker to come for my rescue (still sorry about that one guys!). This moment has come to be my claim to fame as a Nevada geologist (for now anyway).



It's not everyday you find your truck trapped in a gravel bar. It did create some great exposures though.

Since graduating from UNR in 2017 I've been working steadily with Agnico Eagle across the western United States, giving me a chance to learn more about the business of mining and exploration from folks like Gregg Loptien and Jim Leavitt, among many others. Most of the time it feels like my world revolves around rocks, but on my free time I enjoy mountain biking, reading history and getting back "home" to the lush and green water rich environment of northern Minnesota, which stands in stark contrast to the high desert I have grown to enjoy. Although still early in my journey, I feel very grateful for the various mentors, friends, and relationships I've made along the way, including my partner Carolina, whom I met at UNR. I look forward to where this unpredictable industry will take me next, hopefully finding some ore deposits along the way.



Group photo from the UNR SEG student field trip to Mexico, with a few familiar faces.



GSN SO. NEVADA CHAPTER

The GSN Southern Nevada Chapter will be hosting a Zoom meeting on **Thursday, March 4, 2021** at 5:45 pm for social time and announcements; talk at 6:00 pm! Zoom Login will be emailed out to all GSN members prior to the meeting.

Speaker: Dr. Simon Jowitt, UNLV Professor

Title: “Climate change and mining or how mining will save the world; why the minerals industry will be a vital part of the transition to a low-CO2 future”

Abstract:

Climate change mitigation will require a significant decrease in the CO₂ emissions associated with transport and energy generation. However, the material requirements for this transition are often neglected when developing plans and policy around combating climate change. In reality, moving to a low-CO₂ future will require significant (in some cases >500%) increases in production of key minerals and metals beyond the record levels of production the mining industry has already achieved, even if we can also increase the recycling of these commodities. This presentation will outline the mineral requirements for a low CO₂ future, why meaningful climate change mitigation will necessarily rely on the raw materials supplied by the minerals industry, and what implications this might have for the future of mining.

The Meeting Sponsor is PaleoWest (www.paleowest.com)

Thank you,

Josh Bonde, GSN Southern Nevada President

joshua.bonde@nvscicenter.org.

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NEWS FROM THE FOUNDATION

By Cami Prens, GSN Foundation Chair

Scholarship applications for the 2021-2022 academic year will be up on the website next week! There are three scholarships available directly from the Foundation: the DD LaPointe GSN Scholarship, the Brian Morris Scholarship, and the GSN Great Basin Scholarship. In addition, the Foundation has established scholarship endowments at UNR and UNLV and those are administered by the Foundations at UNR and UNLV. Please spread the word that these are available and encourage any students interested in geology to apply.

A trip to Death Valley during this time of Covid seemed a reasonable idea; big spaces, not many crowds, opportunities for appropriate distancing from others, and some warm weather were the draws. It should be a required visit for anyone studying geology – it is simply stunning. Enjoy this photo of the Panamints.



GSN WINNEMUCCA CHAPTER



The GSN Winnemucca Chapter is hosting a virtual lecture on Wednesday, March 10th at 7:00 p.m. The Zoom Login will be emailed to all GSN members prior to the meeting.

Thank you,
Chad Peters
Winnemucca Chapter President
cpeters@ridgeline minerals.com

Speaker: Greg Dering, Headwater Gold

Title: “Precious Metal Potential in the Owyhee Epithermal Belt, Southeast Oregon and Southwest Idaho: Examples from the Katey and Mahogany Projects”

Abstract:

The Owyhee Epithermal Belt (OEB) herein refers to a northwest-trending cluster of epithermal precious metal deposits and prospects associated with mid-Miocene bimodal volcanism, caldera complexes, and extensional basins in southwestern Idaho and southeastern Oregon. The OEB encompasses the Owyhee Mountains of Idaho and the Lake Owyhee volcanic field of southeast Oregon (Rytuba and Vander Meulen, 1990) and is similar to the Northern Nevada Rift (NNR) epithermal belt to the south in terms of scale, timing, and purported genetic origin. Despite the similarities to the NNR, and clear potential as demonstrated by the DeLamar deposit (3.9 Moz AuEq M&I) and the Grassy Mountain deposit (1.1 Moz Au M&I), the region has seen little exploration in the past 30 years, and almost no exploration specifically focused on high-grade vein targets. During a regional reconnaissance and data review campaign in 2019, Headwater Gold Inc. identified and staked several high-grade target areas in the OEB, including the Katey and Mahogany epithermal systems.

The Mahogany and Katey properties lie 30 km and 50 km NW of DeLamar, respectively, and were first identified in the mid-1980s by Manville Corp. At Mahogany Manville discovered high-level chalcedonic veins containing up to 3.3 g/t Au, and mineralized vent breccias with meter-scale blocks of sinter in a silicified matrix that assayed up to 0.6 g/t Au. Rock chip sampling undertaken in 2020 yielded up to 170 g/t Au from a previously unrecognized narrow high-angle crackle breccia zone along a property-scale fault at Mahogany. Mineralization is typical of hot spring-type low-sulfidation epithermal systems and is characterized by widespread chalcedonic silica alteration and a kaolinite-smectite-illite halo. The presence of sinter clasts in the vent breccias, with chalcedonic silica flooding and veining, suggest that the system is nearly fully preserved and that a high-grade, structurally hosted vein target remains untested at depths below 100 m.

Shallow high-grade gold mineralization and alteration at Katey is hosted in a linear rhyolite flow-dome setting at the margin of the Three Fingers caldera. Fracture zones developed at the margin of the Three Fingers Caldera margin appear to be important controls on mineralization and the emplacement of rhyolitic plugs and domes. High-silica porphyritic rhyolite on the eastern part of the property hosts chalcedonic stockwork veins where historic channel sampling yielded up to 5 g/t Au over 5 ft. In the western part of the property pervasively silicified intracaldera tuff and sandstone are cut by quartz-carbonate veins that yielded up to 9 g/t Au and 36 g/t Ag. Limited historic drilling by Manville and ASARCO from 1988 to 1990 tested shallow bulk tonnage targets at Katey, which encountered significant mineralization up to 0.7 g/t Au over 120 ft. Recent detailed geologic mapping, soil and rock chip geochemistry, and high-resolution drone magnetics together highlight several prospective targets at both properties which Headwater plans to drill test in 2021.

GSN Elko Chapter—March 2021 Update

The Elko GSN Chapter will not be having a scheduled presenter during March but we will be making up for it in April with a speaker double-header!

First up is at our regular scheduled date and time, **Thursday, April 15th at 7pm:**

Lucas Monroe from Auburn University speaking on his MS research on the Florida Mountain deposit in the Silver City District, ID. The title of his talk is:

"Using Petrographic and Geochemical Analyses to Elucidate the Genesis of Au-Ag Epithermal Deposits on Florida Mountain, Silver City District, Idaho"

Second up will be on **Thursday, April 22nd at 7pm is:**

Anne Fulton from the Colorado School of Mines speaking on her PhD research on Carlin-type and Carlin-like gold deposits. The title of her talk is:

"Trace Element Zoning in Ore-Stage Pyrite as an Indicator of Fluid Source Characteristics in Carlin-type and Carlin-like Gold Deposits"

We will announce the Zoom details along with abstracts in the April Newsletter, stay posted.

On another note, the Elko GSN Chapter is seeking volunteers for the 2021-2022 year to serve as an officer.

If you are interested in serving in one of the following positions, please submit your name to be included on the ballot that will be distributed later this month.

OPEN POSITIONS:

Vice President

Secretary

Membership Chair

Please submit your name and position of interest to Meredith Baker @ mbaker@rangefront.com

GSN Logoed Masks For Sale Online! **\$10 each + \$3 shipping**



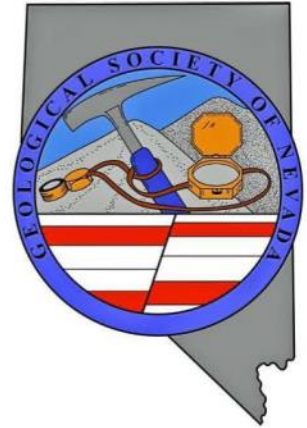
These Stormtech Performance Face Masks have 3-layer protection with anti-bacterial filter built in. Flexible nose bridge, ultra-soft elasticized & adjustable ear loops, machine washable & reusable!

Online ordering available now in the GSN Store online:

<https://www.gsnv.org/shop/gsn-mask/>

Geological Society of Nevada, Elko Chapter:

SCHOLARSHIP OPPORTUNITY



WHO: This opportunity is for any graduate or undergraduate student who intends to pursue or is currently involved with a research topic related to Nevada geology or regionally related to Nevada geology.

WHAT: The successful applicant will be awarded a tuition scholarship in an amount between \$500 - \$1,500 depending on tuition needs.

WHEN: We will be awarding this tuition scholarship for the 2021-22 academic year with a submission deadline of **March 31st, 2021**.

WHERE: Any undergraduate or graduate student with a project that involves Nevada-related geology is eligible to apply for this tuition assistance. Preference will be given to economic geology associated projects within Northern Nevada, but this is not necessary.

WHY: The successful applicant upon completion of their research will be invited give back to GSN Elko in the form of a technical presentation at one of our regularly scheduled meetings to present your research.

HOW: Please submit an application to GSN Elko Executive Committee via mail, email, or online and you will be contacted as opportunities are formalized. You can find application details at: <https://www.gsnv.org/chapters/elko/>

For more details or to send in applications:
GSN Elko Exec. Comm.
P.O. Box 2591
Elko, NV 89803-2591

Or email –
Meredith Baker, Secretary

! mbaker@rangefront.com





GSN 2022 SYMPOSIUM VIRTUAL LECTURE

Thursday, March 25, 2021 at 7:00 p.m.



History of the Modern Gold Rush in Nevada

Richard Reid

Abstract:

It is early in the 1960s. The sun is rising on one of the greatest gold rushes in history. There are faint reddish clouds on the horizon foretelling of the amazing discoveries yet to come. The clouds represent nascent deposits such as Getchell in the Os-good Mountains, Gold Acres in the Cortez district, and upstarts like Blue Star and Bootstrap in the Lynn district of Eureka County. A few geologists seem to see the future. They include John Livermore and J. Alan Coope, with Newmont, who advance gold exploration based on the Ralph Roberts paper describing the alignment of mining districts in north-central Nevada, and therefore focus their efforts on an area north of Carlin, Nevada. The Carlin deposit is discovered in 1962, and this is considered the birth of the modern gold rush in Nevada. Yet, despite this momentous discovery, there is little additional activity until the Bretton Woods Monetary Agreement was terminated in the early 1970s essentially deregulating the price of gold and silver. Slowly, the Nevada exploration community reacts to rising precious metals prices in the 1970s with resumed activity at the established disseminated gold districts such as Cortez and Getchell, and more aggressive exploration on the developing Carlin area.

As the 1970s advance, the gold price rapidly rises, exploration activity increases, mainly in the known historic mining camps and around old producers such as Round Mountain and Battle Mountain, which are destined to become large producers in time. Many old districts prove to have further life with a higher commodity price and modern technology, leading to the development of important resources.

By the end of the 1970s, the gold price peaks, and there is an immediate reaction in the exploration industry to its increase. The Iranian hostage crisis, Arab oil embargo, Soviet invasion of Afghanistan, and Carter-era high inflation rates drive gold upward into unheard of prices as investors head to the yellow metal as a hedge against growing economic and political uncertainty. Gold hits a then all-time high of \$850 per ounce in January 1980, and the race for more gold is on!

The industry, particularly Newmont, following up on research by the U.S. Bureau of Mines, pioneers bulk cyanide heap leaching, which allows lower-grade ores to be developed and processed. The timing could not be better as there exists a small army of well-trained, motivated and resilient exploration geologists, fresh off the uranium boom of the 1970s and the end of the porphyry copper boom of the late 1960s and 1970s. These geologists were trained and mentored by an amazing generation of individuals responsible for discovering and developing decades of resources that built the US into a world leader. In Nevada, a perfect storm was brewing that consisted of extraordinary mineral potential, committed explorers, financial backing, and new technology.

The modern Nevada gold rush took off in the late 1970s with the development of old districts and old mines but exploration rapidly headed into areas of cover including the pediment environment, post-mineral cover, and unmineralized or weakly anomalous pre-mineral cover; conceptual ideas for targeting were also pursued. Some of the largest and most significant discoveries were made by implementing these practices on the Cortez, Carlin, and Getchell Trends, as well as in other areas of Nevada. Drilling technologies (e.g., reverse-circulation) improved considerably over time and allowed for less contamination, faster and improved assessment, and deeper testing of areas previously considered uneconomic for development. New, commercially available geochemical techniques allowed for cheap, rapid, and accurate determination of not only metals of interest in hydrothermal systems, but associated, more dispersed elements useful as vectors to ores.

This paper chronicles, in decadal intervals, the Nevada gold rush, a time of unprecedented exploration discovery and mine development. As part of this study, the discovery histories of 355 precious-metal deposits were reviewed. The rush began slowly and unremarkably through the 1960s and 1970s, then grew into the wild ride of the 1980s propelled by the order-of-magnitude rise in the gold price, which was followed by the more disciplined but significant wave of discovery in the 1990s that led to peak production and reserves. The story continues today, although discoveries are fewer and production has eased as more and more mines transition to underground operations and also from oxide ore to more expensive processing of refractory ore. We examine some of the key factors that shaped the Nevada gold boom through time and offer ideas on where the boom may go.

Richard F. Reid

Richard was born and raised in New York state. He completed a Bachelor of Arts degree from Wesleyan University in Connecticut in 1980 and moved to Nevada in early 1981. He worked initially for Houston Oil and Minerals (subsequently Tenneco Minerals) as a mine geologist at the Manhattan and Borealis mines for five years. He then completed an additional five-year period with Western Gold Exploration and Mining Company (WestGold) doing reconnaissance gold exploration in the Walker Lane. Following WestGold, Richard worked for the next seven years with Pegasus Gold Corporation. Duties included generative gold exploration domestically and internationally as well as near mine exploration in Montana (Beal Mountain) and Nevada (Florida Canyon). Richard went on to work at Newmont Mining Corporation. During his twenty-one years with Newmont he was a Senior Geologist, Nevada Exploration Manager and Exploration Business Development Manager for North America. Richard completed his Newmont career as the Chief Geologist of North America. Richard is now semi-retired but is affiliated with several Canadian junior companies.

Mining Activity Update

Mike Brady, JANUARY 2021

LMBrady@aol.com

NEVADA

McEwen Mining Inc. announced that based on recent studies at the Gold Bar Project, reserves aggregate 17,249,000 tonnes @ 0.84 gpt Au probable. (was 11,900,000 tonnes @ 1.16 gpt Au proven+probable) *Press Release: January 7*

Centerra Gold Inc. announced that it acquired an option to earn a 70% interest in the Cherry Creek Project from Viscount Mining Corp. for \$250,000 cash, and \$8,000,000 in exploration expenditures over 4 years. *Press Release: January 6*

Premier Gold Mines Ltd.(40%) announced that based on recent studies of the South Arturo Project, reserves aggregate 3,474,000 tonnes @ 2.77 gpt Au proven+probable open pit and 126,000 tonnes @ 6.18 gpt Au proven+probable underground. (was 2,840,000 tonnes @ 3.01 gpt Au proven+probable) *Press Release: January 19*

Premier Gold Mines Ltd. announced that based on recent studies of the Cove Project, resources aggregate 1,007,000 tonnes @ 10.9 gpt Au, 29.1 gpt Ag indicated and 3,867,000 tonnes @ 10.9 gpt Au, 20.6 gpt Ag inferred. (was 614,000 tonnes @ 11.57 gpt Au indicated and 3,378,000 tonnes @ 12.17 gpt Au inferred) *Press Release: January 18*

Getchell Gold Corp. announced that recent drill results at the Fondaway Canyon Project include 106.1-128.0 meters @ 6.2 gpt Au (FCG20-02) and 148.7-169.8 meters @ 4.3 gpt Au (FCG20-03). (resource = 2,050,000 tonnes @ 6.18 gpt Au indicated) *Press Release: January 27*

Fiore Gold Ltd. announced that recent drill results at the Gold Rock Project include 117.35-120.4 meters @ 0.28 gpt Au (GR20-095); 48.77-73.15 meters @ 0.29 gpt Au (GR20-097); 192.02-208.79 meters @ 0.71 gpt Au (GR20-099) and 188.98-193.55 meters @ 0.75 gpt Au (GR20-100). (resource = 9,006,000 tonnes @ 0.82 gpt Au indicated) *Press Release: January 27*

Navy Resources Ltd. announced that it acquired an option to earn a 100% interest in the Spanish Moon Property from Nevada Select Royalty Inc. for \$750,000 cash and 750,000 shares over 4 years. *Press Release: January 27*

Contact Gold Corp. announced that recent drill results at the Green Springs Project include 6.1-9.14 meters @ 0.85 gpt Au (GS20-19); 3.05-9.14 meters @ 0.62 gpt Au (GS20-20); 24.38-28.96 meters @ 10.70 gpt Au (GS20-25) and 28.96-44.2 meters @ 0.95 gpt Au (GS20-26). (resource = 754,500 tonnes @ 2.05 gpt Au inferred) *Press Release: January 26*

Blackrock Gold Corp. announced that recent drill results at the Tonopah West/Victor Project include 578.2-581.3 meters @ 1.88 gpt Au, 198 gpt Ag (TW20-041C) and 631.6-650.1 meters @ 1.54 gpt Au, 142 gpt Ag (TW20-061C). *Press Release: January 14*

Corvus Gold Inc. announced that recent drill results at the Lynnda Strip Project include 190.5-239.26 meters @ 0.52 gpt Au (ML20-167CT); 207.96-260.6 meters @ 1.39 gpt Au (ML20-169CT) and 99.06-112.78 meters @ 0.13 gpt Au (ML20-172). *Press Release: January 13*

New Placer Dome Gold Corp. announced that recent drill results at the Kinsley Project include 260.6-271.27 meters @ 5.15 gpt Au (KMR20-04); 22.86-39.62 meters @ 1.19 gpt Au (KMR20-05); 19.81-38.1 meters @ 0.51 gpt Au (KMR20-06) and 294.13-300.23 meters @ 4.83 gpt Au (KMR20-08). (resource = 5,529,000 tonnes @ 2.27 gpt Au indicated) *Press Release: January 11*

First Vanadium Corp. announced that it acquired an option to earn a 100% interest in the AVP Property from private interests (Dave Mathewson) for \$50,000 cash, 1,500,000 shares and \$2,000,000 in exploration expenditures over 5 years. *Press Release: January 14*

President Trump signed a measure that approved the development plans for the Thacker Pass Project of Lithium Americas Corp. (reserve = 179,422,000 tonnes @ 0.33% Li proven+probable) *Press Release: January 15*

Newrange Gold Corp. announced that recent drill results at the Pamlico Project include 32.01-47.26 meters @ 0.11 gpt Au (P20-96); 4.57-10.67 meters @ 0.09 gpt Au (P20-98); 13.72-19.82 meters @ 0.83 gpt Au (P20-99) and 6.1-16.77 meters @ 0.27 gpt Au (P20-101). *Press Release: January 12*

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GSN has rescheduled the in-person meeting to Spring 2022 to assure the health and safety of our members and attendees. We appreciate your continued interest and support in the transition to the 2022 dates. There will likely be changes to the Technical Program, Field Trips and Short Courses. We have received support from those involved to accommodate changes.



GSN Member, Jay Woods, sent me these interesting photos of some work he is doing out near the Columbus Salt Flats. Here is an explanation from Jay, "...I promised you a picture of the quartz vein that I am uncovering at the Baluarte Mines near the Columbus Salt Flats. Across the upper-middle you can see the 4 inch edge of the vein. In the upper right hand corner is a 5 inch fault. The cracks in the granite go through the quartz and are continuous both below and above the vein. The second picture shows a side view. It is not obvious but next to my shadow are three more veins: thinner, parallel to, and lower than the main vein.

If anyone has an interest in the lineaments in igneous rocks, I would be happy to show it off."

Jay can be found in the GSN Directory or email him at: woodsjava@gmail.com



Book Review, by Dave Emmons, GSN Member

I recently read a novel, **McTeague: A Story of San Francisco**, by Frank Norris, about a gold miner at the Big Dipper gold mine in Placer County, California. He ends up moving to San Francisco to become an unlicensed dentist. It tells the story of life in San Francisco in the 1890s and early 1900s. It has romance, murder, theft and betrayal and of course gold and greed.

The book was made into a silent movie in 1923-24 by Eric von Stroheim. Von Stroheim titled the movie "Greed." Much of the filming was done on location in San Francisco and the Big Dipper mine and mill. The filming includes historic stamp milling, underground mining and ore haulage. The 4-hour long silent movie is available on Amazon Prime. The ore is from Pliocene paleo-placer deposits.



Photo 30. Big Dipper Drift Mine, Iowa Hill District. This early view of the Placer County mine looks east. Photo courtesy of Calif. State Library.

Big Dipper Drift mine and mill, Iowa District viewed to the east.

McTeague: A Story of San Francisco, by Frank Norris, 1899. (Excerpt from the book)

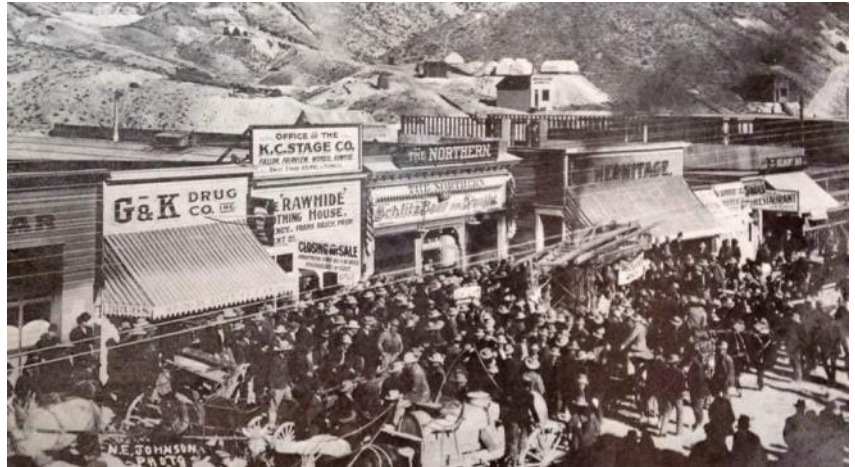
In Placer County, California, she [nature] is a vast, unconquered brute of the Pliocene epoch, savage, sullen, and magnificently indifferent to man.

But there were men in these mountains, like lice on mammoths' hides, fighting stubbornly, now with hydraulic "monitors," now with drills and dynamite, boring into the vitals of them, or tearing away great yellow gravelly scars in the flanks of them, sucking in their blood, extracting gold.

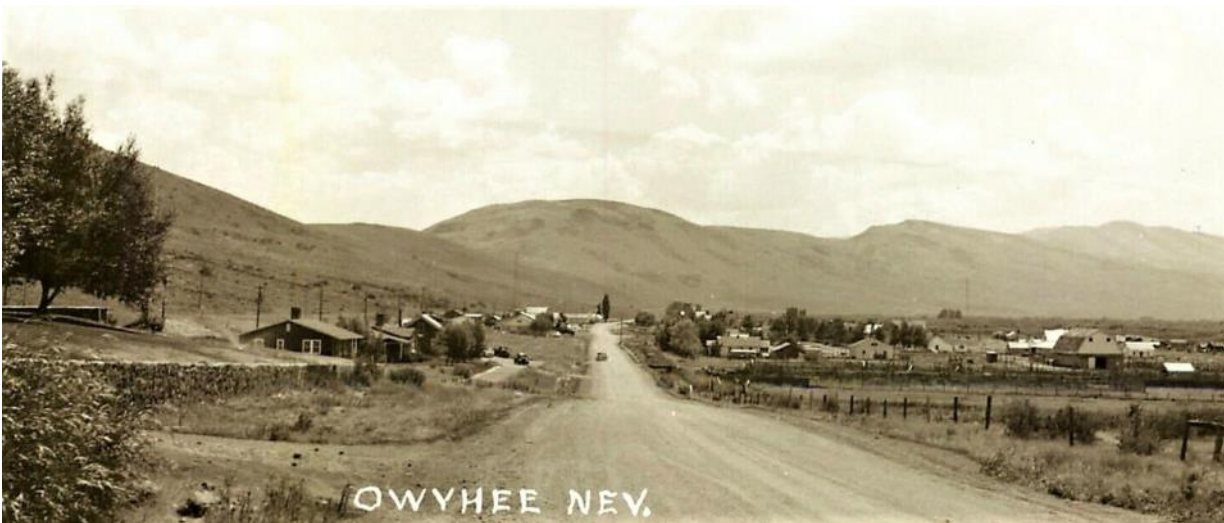
ROCK TALK

GSN Member, Kathy Sestanovich, sent me these great photos that she found on Facebook and I thought some of you members might like to see them. The first one is of Rawhide, Nevada and the date wasn't on it (1907 maybe?). The second is of Owyhee, Nevada in the 1950s.

They are from a Facebook Group called: "Nevada History through Pictures, Collections and Personal Stories" if you're interested in checking out more photos and Nevada history! <https://www.facebook.com/groups/471050472960424/>



Rawhide, Nevada in its heyday (around 1907?)



Owyhee, NV—1950s

OTHER UPCOMING EVENTS

March 4, 2021 Nevada Petroleum & Geothermal Society, Reno, NV NPGS Meeting will take place via Zoom on Thurs., March 4th starting at 7:00 PM. **Speaker and Topic: TBA. Contact Rick Zehner for information: zehnerick@yahoo.com**

March 8-11, 2021 PDAC (Prospectors and Developers Association of Canada Virtual Convention). Visit GSN at the Virtual Exhibit "NEVADA" Booth during the show! GSN, NDOM, NBMG, NMEC and BLM NV are all listed with the NEVADA booth. <https://www.pdac.ca/convention>

Registration deadline is March 31, 2021. The Lowell Institute for Mineral Resources is pleased to announce the offering of the ONLINE "Metallurgical Inputs to Integrated Planning". *A Lowell Institute for Mineral Resources Professional Development Short Course. In collaboration with Freeport-McMoRan Inc.*

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transport agent in the oxidizing porphyry copper model, whereas bisulfide complex is an important way to transport gold in the case of reducing porphyry gold situations. The influence of crustal oxidation state on gold grades in the associated porphyry metal deposits is shown in Figure 2.

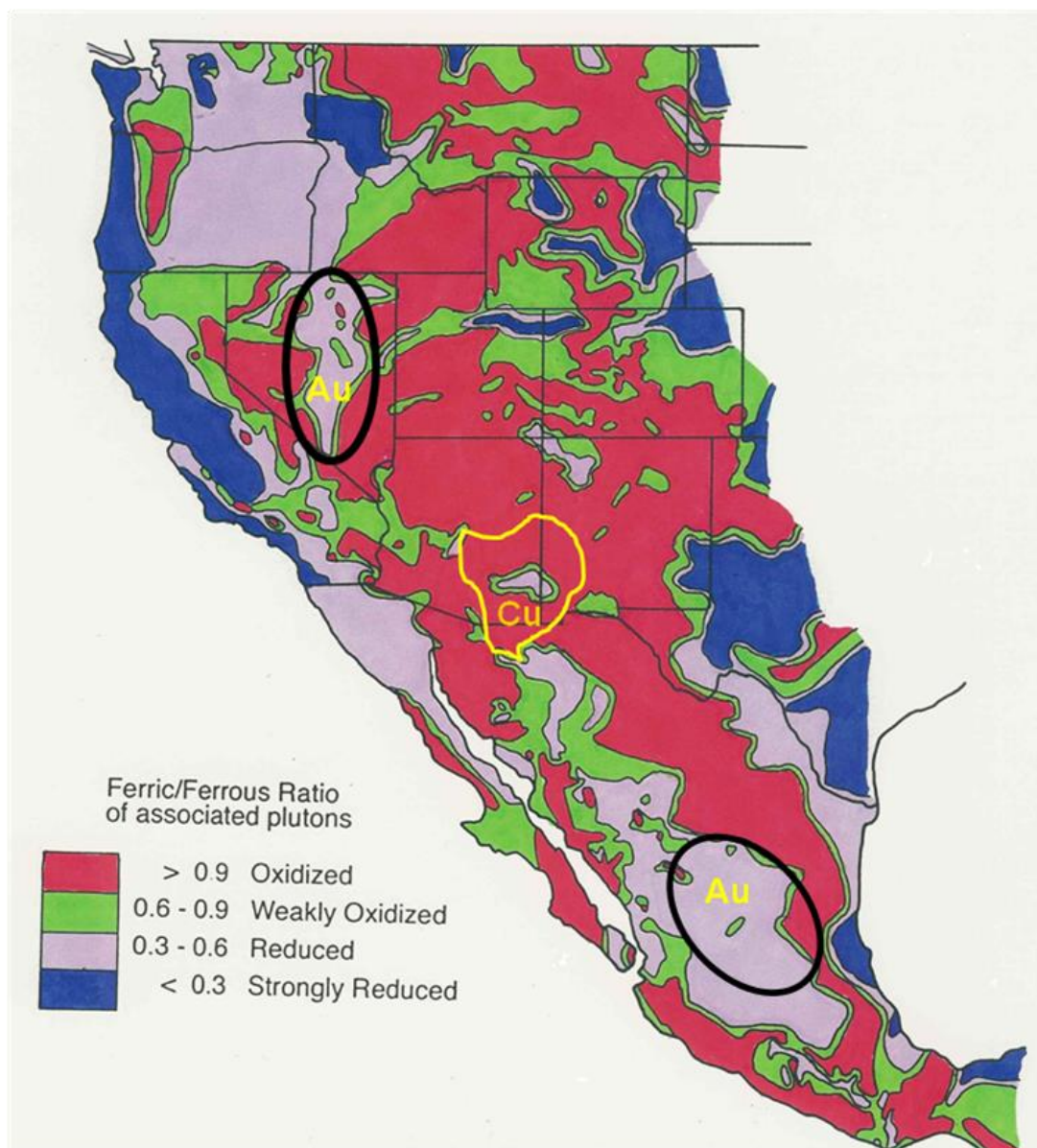


Figure 2: Geographic Patterns of Crustal Oxidation State determined from plutonic ferric:ferrous ratios and mineral assemblages in spatially associated mineral deposits.

The development of the ultradeep hydrothermal/hydrocarbon model (UDH) applied to Nevada case histories (Rasmussen and Keith, 2015, and Keith and others, 2018) for Kupferschiefer Type Cu-Ag deposits offers a new opportunity to enrich the above model (Figure 3). The UDH model also suggests that oil ultimately has a hydrothermal origin, and that like water may be stable as kerogenated supercritical water in the supercritical region between its source in a serpentinization 'kitchen' in the lower-mid crust and a hydrothermal mineral deposit trap in the upper crust. In reduced crust where the hydrocarbon component does not oxidize to carbon dioxide, it is an open unresolved question if petroleum stable fluids like supercritical water can penetrate and mix with magmatic silicate liquids. As such, oil could act incompatibly and leave the magma with metals (e.g. gold) and deposit various hydrocarbon and metal compounds under cooler, ionic conditions.

Experimental data indicates that oil could transport economically interesting amounts of gold. Experiments by Williams-Jones and Migdisov, 2007, show that at 250°C, oil can transport gold at the 50ppb level. The 250°C temperature is well above the conventional oil window, and is similar to hydrous pyrolysis experiments by Lewan, 1997, that generated (continued on page 17)

oil above 300°C. The experimental data is validated by natural occurrence data. At the Rodeo gold deposit in the northern Carlin trend of Nevada, a spectacular pyrobitumen vein has been documented by Williams-Jones and others, 2009, that carries bonanza grade gold at 30 ppm (Figure 4).

It is now becoming increasingly apparent that high temperature hydrothermal gold is not simply an exception but may be the rule and that yellow gold and black gold both owe their origin to deep seated hydrothermal processes.

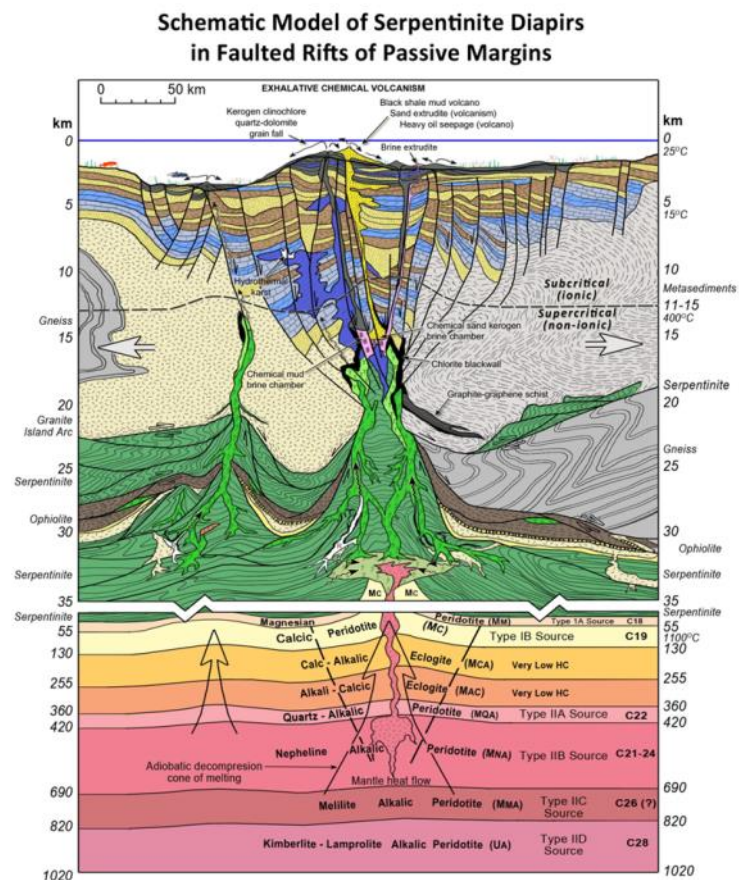


Figure 3. Ultradeep hydrothermal (UDH) model for crustal scale hydrothermal plumes in incipient continental rift settings like Kupferschiefer in northern Europe and the Hydrothermal Hydrocarbon Petroleum systems of Basin-Range age in the Great Basin.

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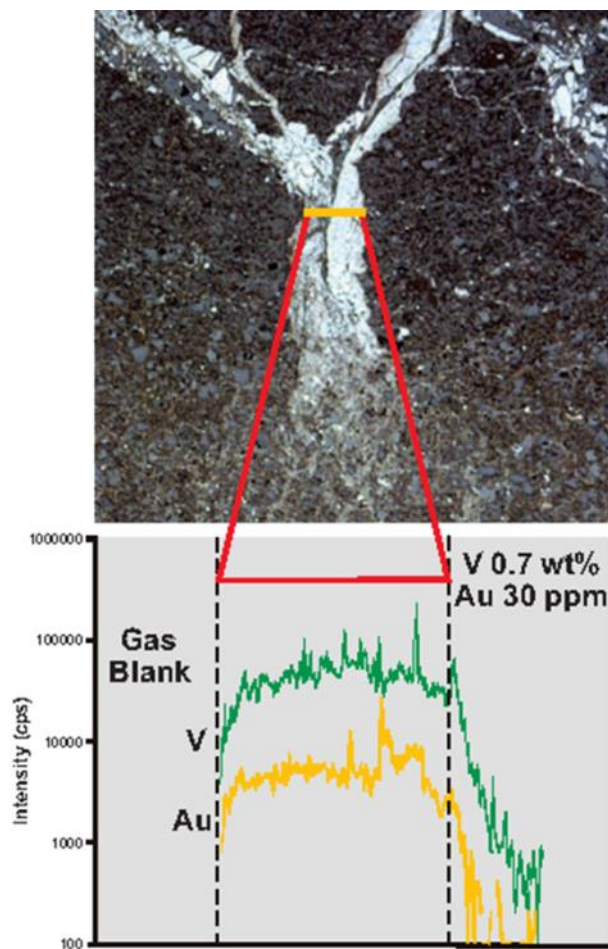


FIGURE 4 Pyrobitumen vein containing 30 ppm gold from the El Rodeo deposit, Carlin Trend, Nevada. The uniform nature of the laser ablation ICP-MS gold profile across the vein and its parallels with the vanadium (V) profile show that both metals are homogeneously distributed and suggest that they are chemically bound in the pyrobitumen. PHOTOGRAPH AND LA-ICP-MS PROFILES SUPPLIED BY P. ENXIO

The bonanza grade pyrobitumen vein provided the first evidence we have seen that shows that oil is hydrothermal and can carry a significant amount of metals (in this case, gold) (from Williams-Jones and others, 2009).

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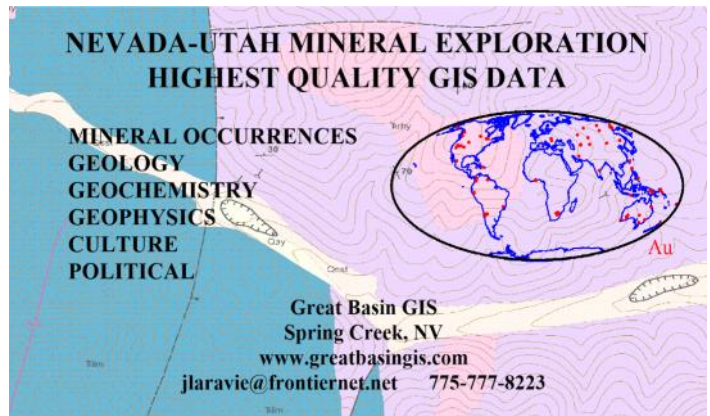
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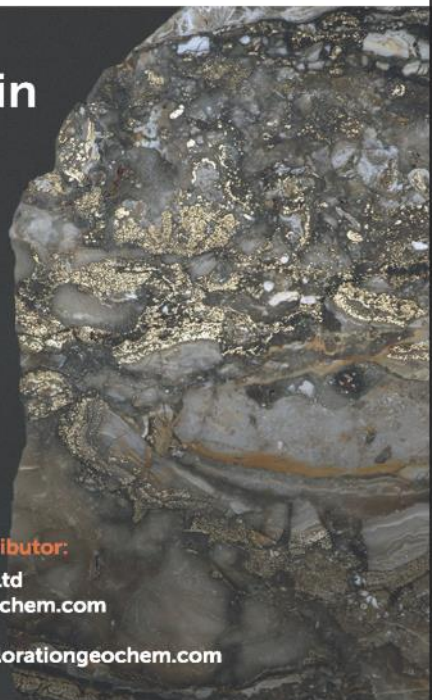
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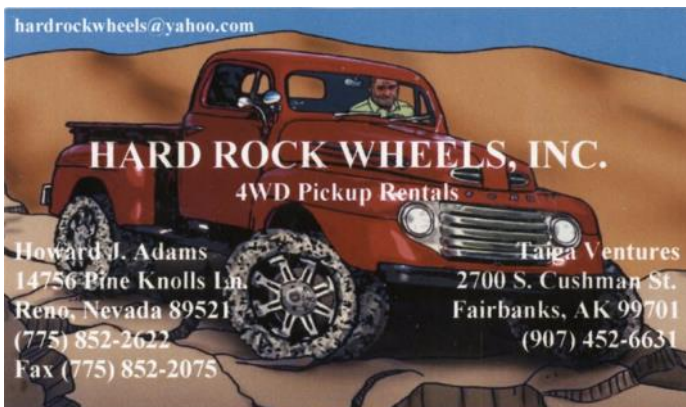
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