



GEOLOGICAL SOCIETY OF NEVADA NEWSLETTER

Geological Society of Nevada, 2175 Raggio Parkway, Room 107, Reno, NV 89512
(775) 323-3500 - Hours Tuesday -- Friday, 8 a.m. to 3 p.m. Monday by appointment.
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CALENDAR OF GSN EVENTS

- March 3, 2016 THURSDAY** **SO. NEVADA CHAPTER MEETING (1st Thursday of the month)**
The meeting will be held at the Las Vegas Natural History Museum, 900 Las Vegas Blvd North. **Speaker: Dr. Shichun Huang** of the UNLV Geoscience Department. Title: "Who killed mammoths? The younger dryas impact hypothesis". **Food Sponsored by: MARY KLINGER. GSN Member.** Please contact Josh Bonde for more information: Joshua.bonde@unlv.edu. Details on page 6.
- March 9, 2016 WEDNESDAY** **WINNEMUCCA CHAPTER MEETING (2nd Wednesday of the month)**
The meeting will be held at the Martin Hotel, 94 W. Railroad St., Winnemucca, NV. Drinks at 6 p.m. Appetizers at 6:30 p.m. and talk at 7:00 pm. **Speaker: Sam Street, HR Professional.** Title: "Finding Work in a Tough Market". **Food & Drinks Sponsored by: GEOTEMPS, INC.** For more info please contact James Carver @ jcarver@silverstandard.com. Details and abstract on page 7.
- March 17, 2016 THURSDAY** **ELKO CHAPTER MEETING (3rd Thursday of the month)**
The meeting will be held at the Western Folklife Center, 501 Railroad St., Elko, NV. Refreshments begin at 6 pm. Talk at 7:00 pm. **Speaker: Rich Perry, NV Division of Minerals.** Title: "Nevada Minerals, Geothermal and Oil Production Update". **Food & Drinks Sponsored by: TONATEC EXPLORATION, LLC.** For more info please contact Mark Travis at: mark.william.travis@gmail.com. Details on page 6.
- March 18, 2016 FRIDAY** **GSN MEMBERSHIP MEETING (3rd Friday of the month)**
The GSN meeting will be held at the Reno Elks Lodge, 597 Kumle Lane, Reno, Nevada. Social hour begins at 6 pm, Dinner is at 7 pm and talk begins at 7:45 pm. **Speaker: Moira Smith, Pilot Gold.** Title: "Goldstrike: Rediscovering a large, Carlin-style gold system in southwestern Utah". **Drinks Sponsored by: ENVIROSCIENTISTS, INC.** Cost for Dinner—\$25. Please make reservations for dinner with Laura Ruud at the GSN office: gsn@gsnv.org or call her at 775-323-3500. Details and abstract on page 3.

G.S.N MARCH MEETING SPONSOR



Enviroscientists, Inc.

FROM THE PRESIDENT
Elizabeth Zbinden, G.S.N. President 2015-2016
with contributions from guest writers Chris Henry and Jim Faulds, NBMG
MARCH 2016

Seeking New Geologic Maps

Well, enough politics for now. This month again I encourage GSN members to action, but I think you will like this one better because it involves actually doing geology!

Nevada Bureau of Mines and Geology, or the Bureau as it is affectionately known, has published geologic maps of the entire state at large scales – the statewide map, the county maps – and is working diligently at publishing maps of the entire state at the more detailed scale of 1:24,000. As you may know, there are several geologists at the Bureau whose job is focused on making geologic maps. But did you know that the Bureau also publishes maps that are done by other geologists? Many exploration and mining companies have had their geologists produce geologic maps and often that information remains hidden away in company files. After the discovery is made, or after you are no longer interested in the property, it would be a great contribution to the geologic resources of the state to submit the map for publication. Others who might have maps in search of a publisher would be students and academic research geologists.

The Bureau can publish maps either as Open-file Reports, which undergo a streamlined review and editing, or as Map series, which undergo at least office review by at least two geologists who know something about the geology. The Bureau always used to do field reviews of Map series also, but not always now because of time, budgetary, and people limitations. Some areas that are really exciting probably would get field review in part because a lot of people might like to see it with the authors and argue about the geology, i.e., what geologists most like to do in life. The OFR route is obviously a little easier, but it's the author's choice. Reviewers could be two people from the Bureau or two people outside the Bureau (but generally Chris Henry reviews any northern Nevada map and Jim Faulds southern Nevada - Las Vegas area), or a combination.

Maps do not have to correspond to the boundaries of a 7.5' topographic quad. They don't even have to be quad-shaped. They do have to be high-quality geologic maps of bedrock and/or Quaternary surficial units. A lot of maps these days are of "geologic entities", e.g., a specific part of a range or an interesting area of mineralization, and can be less than a quad, multi-quads, whatever, as long as there's some logic to it.

Your own Geological Society of Nevada Foundation enters in to the picture here too: One of the ongoing projects of the foundation is to provide financial support for the publication of geologic maps.

So here is your assignment: Have you done some geologic mapping in Nevada that you'd like other people to be able to use? For me, the most satisfying part of doing a body of work is to see it being used. Perhaps for you too. If you made the map on company time, get permission from them, or if you made it on your own time just bring it in yourself. Contact Chris Henry or Jim Faulds about having the Bureau publish it.

***The G.S.N. wishes to thank the
SPONSOR OF OUR FEBRUARY 2016 MEETING in RENO!!***



HYDRO RESOURCES—WEST, INC.

GSN Friday, MARCH 18, Membership Meeting

For dinner reservations, please e-mail gsn@gsnv.org or call 775-323-3500

by 5:00 p.m. on WEDNESDAY, MARCH 16TH!!

Social Hour begins @ 6:00 pm; Dinner @ 7:00 pm;

Speaker to Follow @ 7:45 pm

Location: RENO ELKS LODGE, 597 KUMLE LANE (across from the Convention Center)

DINNER COST—\$25.00 per person (Reservation no-shows will be invoiced.)

Guest Speaker: Moira Smith, Pilot Gold

Goldstrike: Rediscovering a large, Carlin-style gold system in southwestern Utah

Moira Smith and Peter Shabestari, Pilot Gold

Goldstrike is a Carlin-style, sediment-hosted gold property located in southwestern Utah, 50 km northwest of St. George, with a stratigraphic and structural setting and gold mineralization similar to other sedimentary rock-hosted gold systems in the Great Basin, including the Carlin and Cortez trends.

Modern exploration on the property began in the 1980's with the identification of widespread Carlin-style gold mineralization. Tenneco mined oxidized, disseminated, sediment-hosted gold ore with an average grade of 1.2 grams/tonne (0.035 ounces/ton) from 12 shallow pits along a northeast-striking trend over a distance of approximately 6.5 kilometres (4 miles). Total production was on the order of 209,000 ounces of gold and 198,000 ounces of silver. The property was sold to USMX in 1993 and the mine was closed in 1996 and fully reclaimed.

At Goldstrike, tertiary volcanic and sedimentary rocks rest unconformably on a basement of deformed middle and late Paleozoic carbonate and siliciclastic rocks. The sequence is cut by steep, arcuate oblique-slip faults that form a series of horsts and grabens. Mineralization is focused at the intersections of the unconformity with these faults. Gold mineralization on surface and in shallow drill holes has been discovered over the entire property, wherever the basal unconformity of the Tertiary sequence is exposed on surface, particularly in areas of structural complexity.

In August 2014, Pilot Gold acquired Cadillac Mining, gaining control of 100% of the Goldstrike project. At present, the property comprises 5,515 hectares (13,629 acres), including unpatented U.S. federal lode claims, patented lode claims and Utah State Leases. Since acquisition, Pilot Gold has compiled a digital database of drill holes (+1,500), blast hole samples (+100,000) and historic rock and soil samples, and has constructed a 3D model of geology and mineralization. A first reverse circulation drill program comprising 18 holes and 2,877 metres was completed in mid-November, 2015, with highlights including 39.6 metres grading 1.01 g/t gold in PGS003; 41.1 metres grading 0.84 g/t Au in PGS004; and 22.9 metres grading 1.68 g/t Au in PGS008, including 12.2 metres grading 2.67 g/t Au. The drilling indicates that mineralization extends down-dip under shallow cover north of the mined pits, representing significant upside potential in this emerging district, and further highlights the prospectivity of the Paleozoic shelf area of the Basin and Range outside of the main trends.

Moira Smith Bio:

Moira Smith is the VP Exploration and Geoscience for Pilot Gold. She is a relative newcomer to the Great Basin, having lived and worked there for about 10 years, but has had the good fortune to have participated in modeling, drilling and initial resource estimation at Long Canyon, finding a new zone at Kinsley Mountain, and putting together the evolving story at Goldstrike. Prior to Pilot Gold, Moira was Chief Geologist for Fronteer Gold, and a Senior Geologist for Teck, where she worked all over the Americas, including work at Pogo (Alaska), El Limon (Mexico) and Petaquilla (Panama). Moira holds a PhD from University of Arizona. She loves the exploration community and gives back by sitting on a lot of committees, most recently as co-chair of the technical sessions for the 2015 GSN Symposium.

FACES OF GSN

Korin Carpenter

I was born and raised in the Skagit Valley of Washington State where my love of the outdoors and science grew from an early age. Our family spent holidays camping, hiking, and exploring the Pacific Northwest. When we weren't enjoying the outdoors I stayed extremely busy; I was involved with swimming, music, and shooting sports. Outside of school I earned a black belt in TaeKwonDo and rebuilt a '67 Mustang.



Father, sister and me—Oregon Coast, 1988.

With such diverse interests when I started college at Central Washington University in Ellensburg, Washington, I was unsure of what field I wanted to pursue. I was still involved with swimming and music and though I loved those activities I couldn't see myself doing either as a career. In my second quarter I signed up for intro geology, it clicked and I declared a few weeks later. Through my time at Central I was highly involved in the Geology Department, serving as Geology Club and Honor Society President, invited to TA Introduction to Field Methods, and performed undergraduate research in igneous petrology. I had amazing professors who taught with intensity and expectations of excellence. Not only did it grow my passion for geology, I made the most amazing lifelong friends in the process.

After being the first in my family to graduate with a college degree, I moved to the Seattle area and to work in environmental consulting performing soil and groundwater assessments and monitoring all around the Pacific Northwest. Although I enjoyed the work and the conveniences that can only be

found in the big city, there was something about the concrete jungle that I wanted to escape. A good friend of mine was working in exploration and suggested I check it out. Three weeks later I moved out of my apartment, loaded up a storage unit and caught a southbound plane to Saltillo, Coahuila, with a final destination of Concepcion del Oro, Zacatecas. Working in Mexico was an exciting challenge, not just in learning the ins and outs of exploration and skarn geology, but I got off the plane with a handful of Spanish nouns in my vocabulary and little ability to form a sentence. It was an invaluable experience, I learned to speak Spanish by immersion, which led to the ability to read and write as well. I also fell in love with the complexity of skarns and overcoming the challenges drilling sometimes presents. Through that love and connections by virtue of the great people I worked with I got an amazing opportunity to work at Pumpkin Hollow in Yerington, Nevada. Aside from a short hiatus, which I spent as a Mine Geologist at Mesquite Mine in Southern California, I was at Pumpkin Hollow from 2008 until the beginning of this year.

Amazing is not a strong enough word to describe my time there. So many opportunities to learn and grow along with the (cont. on pg. 5)



Groundbreaking at Pumpkin Hollow Shaft Site, 2012.

(Faces cont. from pg. 4)

project. I was privileged to be involved with many steps and processes far beyond that of a typical exploration setting. Hydrology, geotechnical studies and evaluations, geologic other considerations and logistics of shaft sinking and lateral development, academic research, truly understanding a project's geology and so much more. Most of all, working under the guidance and mentoring of Greg French and Hank Ohlin, have not only extended my family, but given me the ability to be the geologist I am today, and for that, I am extraordinarily grateful.

Outside of geology, my interests and hobbies remain diverse and plentiful. Some of my favorite things to do are lifting at the gym or practicing yoga and have even competed in bodybuilding competitions. Riding my Harley presents a refreshing and unique perspective of the world and nature. I am an avid photographer, mostly landscape, though I enjoy shooting the occasional event or portrait session. I still love to play the flute, although I have not participated in performance since college. I also enjoy shooting and hunting, with both firearms and archery. I can be found exploring roads less traveled, hiking, or camping, and participating in any number of outdoor activities. I cannot imagine my life without geology and the people I have connected with along the way and I look forward to what the next chapter holds.



Lifting weights with KTVN's Kristen Remington during her 2013 "Someone to Know" segment on Channel 2 News.



Hawaii 2011



Touring Yosemite 2013

GSN SOUTHERN NEVADA CHAPTER MEMBERSHIP MEETING

THURSDAY, MARCH 3, 2016

Location: Las Vegas Natural History Museum, 900 Las Vegas Blvd. North

Time: Pizza & Drinks @ 5:30 p.m., Talk begins @ 6:30 p.m.

SPEAKER: Dr. Shichun Huang, Geochemist, UNLV Geoscience Department

TITLE: "Who killed mammoths? The younger dryas impact hypothesis."

(Dr. Huang will also talk briefly about the new analytical equipment he has set up here at UNLV.)

Food Sponsored by: **MARY KLINGER, GSN Member**

GSN ELKO CHAPTER MEMBERSHIP MEETING

THURSDAY, MARCH 17, 2016

Location: The WESTERN FOLKLIFE CENTER, ELKO, NEVADA

Time: Refreshments/Appetizers @ 6:00 p.m., Talk @ 7:00 p.m.

SPEAKER: Richard Perry

TITLE: "Nevada Minerals, Geothermal and Oil Production Update"

Food and Drinks Sponsored by: **TonaTec Exploration LLC**



Abstract: The Nevada Division of Minerals is responsible for collecting all mineral, geothermal and oil production data each year and publishing this in an annual report. While 2015 metals and industrial minerals production data is not yet complete, the previous two years saw a decline in gold production and significant increase in industrial mineral and geothermal energy production. Base metal production across the state has remained relatively steady.

Thank you to the SO. NEVADA CHAPTER Meeting SPONSOR for FEBRUARY 18, 2016!

Thank you to the ELKO CHAPTER Meeting SPONSOR for FEBRUARY 18, 2016!



OLYMPUS

GSN WINNEMUCCA CHAPTER MEMBERSHIP MEETING

WEDNESDAY, MARCH 9, 2016

Location: The MARTIN HOTEL, WINNEMUCCA, NV

Time: Drinks @ 6:00 p.m., Appetizers @ 6:30 p.m., Talk begins @ 7:00 p.m.

SPEAKER: Sam Street, HR Professional

TITLE: “Finding Work in a Tough Market”

Food and Drinks Sponsored by: **GEOTEMPS, INC.**

Outline: My recent experience in a job search. A Human Resources professional's view from the “other side” of the desk.

Sam Street: 30+ plus years in HR. Worked in oil and gas, chemicals, copper, coal, and gold, this is the only time I have seen energy, coal and hard rock all low at the same time.

What I will cover is my experience – I am sharing what I learned and not endorsing any company or products.

Websites

⇒ My experience in a recent job search

Networking

Search Firms

Agencies



⇒ , Manpower, etc.

⇒ Great sources

⇒ Register with them

⇒ Companies use them daily

⇒ They have contacts – and contacts lead to jobs

⇒ Have them review your resume

⇒ Interviewing skills

Job Searches at various levels of work experience

What can I do now?



Thank you to the WINNEMUCCA
CHAPTER Meeting SPONSOR
for FEBRUARY 10, 2016!



Nevada Geology Calendar 2017 Photo Contest—deadline May 31, 2016

WANTED: Photos for the 2017 calendar showing Nevada geology at its best!

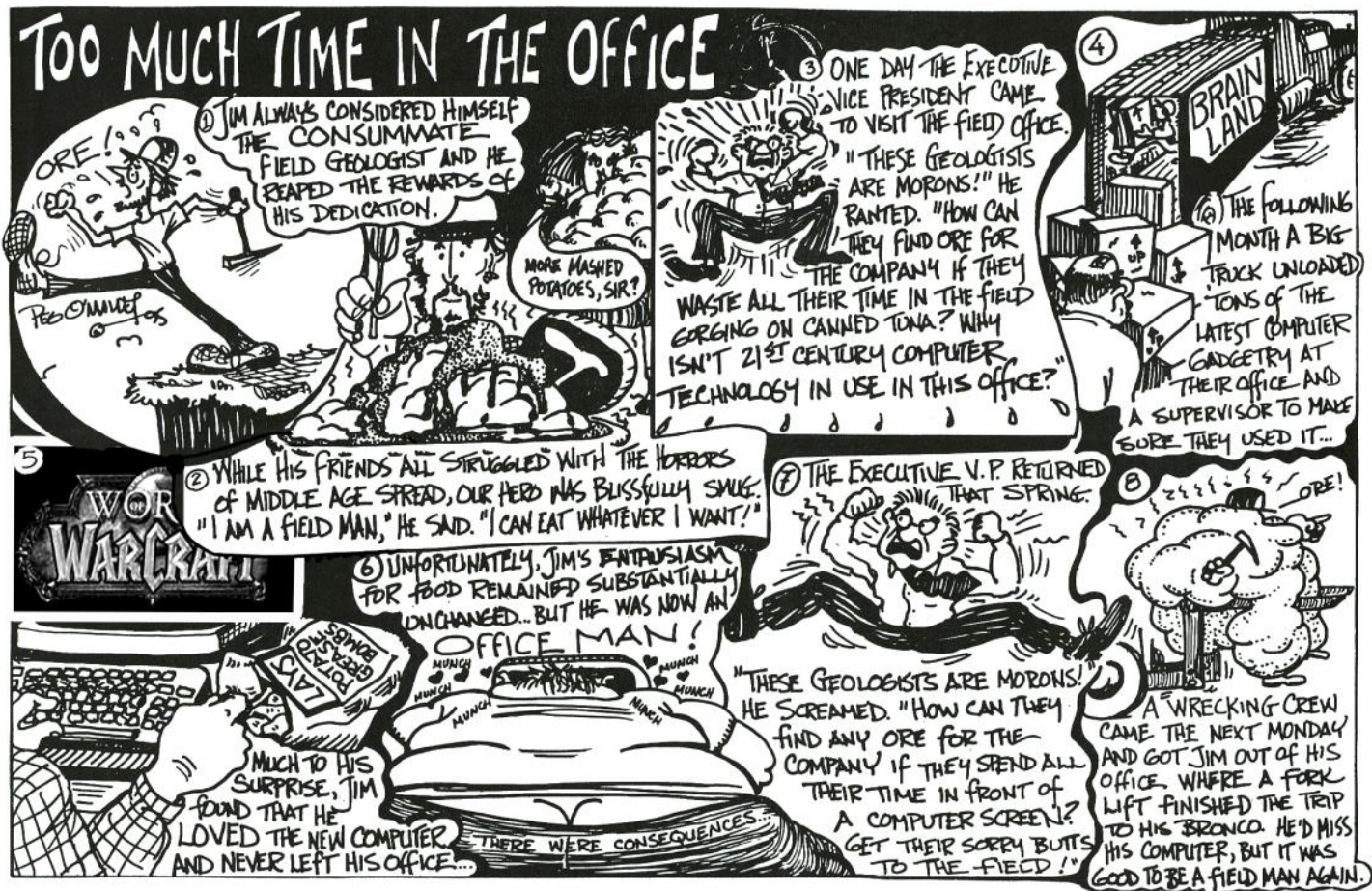
Here are the details for the 2017 calendar contest:
www.nbmj.unr.edu/docs/2017_Calendar_photo_contest.pdf

- **Deadline for entries is May 31, 2016.**
- Photos need to be taken in Nevada. A location description and/or GPS coordinates should accompany submissions along with description.
- High-quality, high-resolution photo files of at least 300 dpi are required for quality printing.
- You may enter as many photos as you wish.
- Email submissions to Jack Hursh (jhursh@unr.edu).
- NBMJ Cartographers will make the final decision on the winning photos.
- Prizes will be awarded for first-, second-, and third-place winners.

SAVE THE DATE!!
SATURDAY, JUNE 18, 2016
GSN'S ANNUAL GOLF TOURNAMENT
WASHOE GOLF COURSE, RENO, NV



SPONSORED BY:

A Peg O'Malley Cartoon Classic—Reprinted from the GSN newsletter archives. Circa ~late 1990s or early 2000s)



Conservation Credit System (CCS) Verifier Training

Elizabeth Zbinden



Background: This Conservation Credit System is a tool to allow human activities to generate a net benefit to the greater sage-grouse habitat. It is run by the Nevada State Sagebrush Ecosystem Program, a state program entirely separate from the Department of Interior resource management proposals related to the sage-grouse. To find out more about the Nevada State Sagebrush Ecosystem Program and the Conservation Credit System, you can check this website: <http://sagebrusheco.nv.gov/CCS/ConservationCreditSystem/>

If you would like to become part of this by qualifying as CCS Verifier, please read the announcement below:

Conservation Credit System (CCS) Verifier Training

Who: Anyone who is interested in becoming a Certified Verifier to run the CCS Habitat Quantification Tool for credit and debit projects must complete this training.

What: This is a two section training over the course of three days. Potential Certified Verifiers can attend one or both sections. Verifiers can be certified in the GIS Desktop Analysis, Field Data Collection Methods, or both.

Due to the interest in this training, we will at first be limiting it to only those interested in becoming Certified Verifiers. The training is limited to 40 people in each section. Seats are available on a first come first serve basis, so early registration is encouraged. Registration is required to attend.

When:

GIS Desktop Analysis Training: Tuesday, March 29 – 30, 9am to 5pm

Field Data Collection Methods Training, March 31, 9am to 5pm

(Be prepared for a half day of field training, e.g. proper shoes, sunscreen, etc.)

There will be a 1 hr break for lunch. Options near the facility are limited, so it is advisable to pack a lunch.

Where:

**Nevada Division of Forestry Building
NV Army National Guard and Emergency Management Complex
2478 Fairview Drive
Carson City, NV 89701**

(A valid driver's license is required to enter the complex)

How to Register:

To register contact Melissa Faigeles at mfaigeles@sagebrusheco.nv.gov or 775-684-8600

Please specify:

- which training you wish to register for (GIS Desktop Analysis, Field Data Collection Methods, or both);
- your name;
- professional association;
- email address; and
- phone number

Seating is limited so early registration is encouraged!



G.S.N. SPRING 2016 FIELD TRIP –SAVE THE DATE!!

Alan Coyner, GSN V.P. and Field Trip Leader



Please join us for the GSN Spring Field Trip titled "Nevada's Golden Giants: Goldstrike and Gold Quarry" as we travel to the famous Carlin Trend. We will be leaving Reno on Friday afternoon, May 6th and staying in Elko on Friday and Saturday nights. The Goldstrike tour is on Saturday, May 6th, followed by cocktails, dinner, and a speaker in Elko. The Gold Quarry tour is Sunday, May 8th, with the return to Reno late Sunday. A reduced price option without housing will be available to our Elko members. A reservation form will be available in early April.

New Geothermal Resource Potential Assessment, White Pine County

Title: **Geothermal Resource Potential Assessment, White Pine County, Nevada**

Author: **Nicholas H. Hinz, Mark F. Coolbaugh, and James E. Faulds**

Year: 2015

Series: NBMG Report 55

Format: 21 pages, color

Free download or purchase here:

<http://pubs.nbmgs.unr.edu/Geothermal-assess-White-Pine-Co-p/r055.htm>

Geothermal resources can potentially contribute toward the renewable energy portfolio of White Pine County (WPC) in two ways: first through the direct conversion of heat energy into electricity, and the second by way of direct-use applications in which thermal energy is used as a source of heat for buildings, greenhouses, and related structures. Several known geothermal areas within WPC lie proximal to the Southwest Intertie power line currently under construction.

A potential source of electricity could come from conventional geothermal systems associated with young faults and regions of active crustal deformation. These systems have a total installed capacity in the Great Basin region of nearly 1,000 MWe. White Pine County hosts several geothermal systems of this type, but none are currently producing electricity. White Pine County has relatively low rates of crustal deformation relative to western Nevada or the Wasatch region of Utah (e.g., faulting accommodating crustal extension). However, based on a review of the geology in the region, we conclude that sustained and reasonable exploration efforts could result in the discovery and development of one or more electricity-grade geothermal systems, with potential generation capacity at each system in the range of 1–20 MWe.

In addition, a new and unproven type of potential geothermal resource termed “deep stratigraphic reservoirs” or “hot sedimentary aquifers” has recently been proposed in the western United States. White Pine County, and in particular, the northern Steptoe Valley, has some of the most promising potential for electricity generation from this type of reservoir in the United States. Preliminary calculations suggest that as much as 500 MWe of baseload electricity in the northern Steptoe Valley could be produced from this type of reservoir using wells reaching depths of 2 to 4 km. The economic feasibility remains unproven, but initial estimates are encouraging.

Based on observed surface temperatures and flow rates of springs, several geothermal systems in WPC also have the potential for direct use, including the heating of buildings and greenhouses. Such uses could reduce the consumption of electricity generated from fossil fuels and could lead to economic expansion by extending the growing season for certain agricultural products and reducing utility costs.

Funding for this work was provided by a grant from the Department of Energy.

More information on geothermal energy:

<http://www.nbmgs.unr.edu/Geothermal/index.html>

GSA Presidential Address by Jon Price: The World is Changing

GSA 2015 PRESIDENTIAL ADDRESS

"The world is changing. Our science is increasingly global, as we recognize the challenges of understanding interconnected Earth systems, meeting the rising global demand for mineral and energy resources, handling tradeoffs regarding sustainable development, and reducing the risks of natural disasters that impact the global economy. The geosciences are vital to meeting these societal challenges. The future is bright for the geosciences, from many perspectives."

You can read the text for the complete address here (GSA Today, January 2016):

<http://www.geosociety.org/gsatoday/archive/26/1/pdf/i1052-5173-26-1-4.pdf>

GSN Newsletter Monthly Advertising Rates*

Business Card Size (3½ x 2") \$ 50.00

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Half Page (7½" x 4¾") 300.00

Full Page (7½" x 9½") 450.00

Classified ads (per line)
(up to business card size) 10.00

For an advertising form please go to:

<http://gsnv.org/info/forms/Newsletter%20Ad%20Form.pdf>

or email: gsn@gsnv.org. Digital ads must be received by the 25th of the month to appear in the following month's newsletter (.jpg, .png, .tiff, .docx preferred).

Advertising guidelines:

The GSN Newsletter is published monthly except June and July.

Placement of ads will be rotated and displayed in random order each month.

Digital ads and payment **must be received by the 25th of the month** in order to be placed in the following month's newsletter.

The Executive Committee reserves the right to reject any ad which it may find inappropriate.

*10% Discount for 10 months advertising paid in advance.

*Thank you to our generous
donors in February!*

G.S.N. Student Dinner Fund

Hallet Elson
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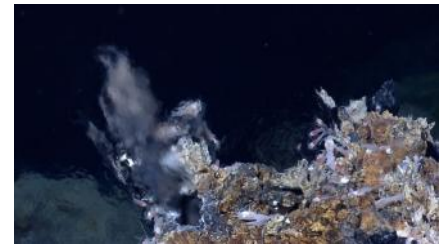
ROCK TALK

New Type of Seafloor Vent Discovered, Dominated by Talc

By Jeffrey Marlow | February 8, 2016 1:38 pm

(reprinted from Discovermagazine.com, The Extremo Files)

In 1977, with the discovery of heated water spewing metals from the seafloor along the Galapagos Rift, scientists were taken by surprise. The ocean floor had always been assumed to be a static, low-energy environment, a passive repository for detritus falling from more dynamic surface waters. But the powerful vents re-



An active hydrothermal vent at the Von Damm hydrothermal field. (Image: NOAA Okeanos Explorer Program, MCR Expedition 2011)

vealed a new dimension to the deep sea – it was an important interface between the molten mantle and the surface world, a site where enormous amounts of energy were streaming into the cold depths of the oceans.

In the intervening decades, hundreds of seafloor vents have been discovered, but they have typically fit within a narrow classification scheme. "Black smokers" are the most well-charted, found pervasively along mid-ocean ridges where new oceanic crust is formed. Slightly cooler systems epitomized by **Lost City** are the result of mineralogically-specific water-rock interactions. Methane seeps are found most frequently along convergent plate margins, where hydrocarbons break down at depth and are pushed upward into seafloor sediments.

While these features all look very different, they're universally exciting for biologists: with the potential for energetic input separate from the sun, a whole new world of chemosynthetic possibility opened up. Indeed, the resulting analyses were a biological bonanza, revealing new types of metabolisms, innovative symbioses, and bizarre, otherworldly creatures.

But as exciting as these vent-based discoveries have been, the picture is incomplete. The fact that so few distinct types of vents have been cataloged is likely due more to our poor coverage of the ocean bottom rather than any first-order geophysical principles.

In December, however, a team of researchers from the National Oceanography Centre and the University of Southampton in Southampton, England, published a remarkable new finding: a new type of hydrothermal vent.*

At the Von Damm Vent Field (VDVF) in the Caribbean Sea, diverging plates move apart at a mere 15 millimeters per year – much slower than most mid-ocean ridges. This didn't seem to bode well for rigorous venting activity: "It was originally thought that ultra-slow spreading ridges would not be able to support hydrothermal activity," notes Matthew Hodgkinson, a PhD student at the University of Southampton who led the study. "As the spreading rates get slower, you generally have a lower magma supply and less heat to power hydrothermal vent fields."

Which is why the 1997 discovery of hydrothermal venting at the ultra-slow spreading Southwest Indian Ridge came as a surprise. VDVF follows in this tradition, and is even more surprising given its slightly off-axis position. Electron-rich 200-degree (C) water was supporting a rich ecosystem comprised of (cont. on pg. 14)

ROCK TALK

The following article from the Las Vegas Sun is being reprinted so that the GSN membership can gain a greater understanding of how the media portrays mining in Nevada.

Mining 101: A brief history of the industry in Nevada

Reprinted from the Las Vegas Sun online, Feb. 1, 2016

<http://lasvegassun.com/news/2016/feb/01/mining-101-a-brief-history-of-the-industry-in-neva/>

By *Sun Staff* (contact), Monday, Feb. 1, 2016 | 2 a.m.

Did you know?

Drones capture data from the air and provide information for computer models that map mines. Unmanned aircraft also track stockpiles and equipment.

Modern-day mining in Nevada is a high-tech business, not a get-rich-quick dream.

Operators use drones to survey, monstrous trucks to haul and T-Rex-sized power shovels to chomp into the ground. Permits and environmental applications take years to approve.

Technology has transformed the business. But the first step remains the same: Stake a claim.

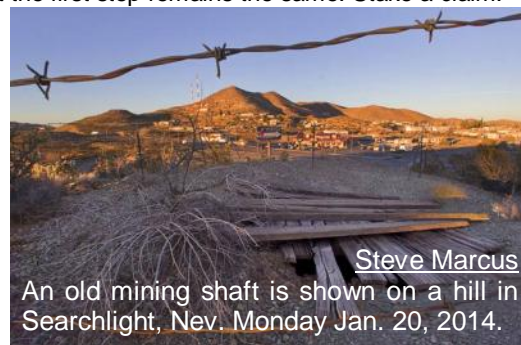
HOW TO STAKE A CLAIM

Unlike the old days, mining companies no longer can simply slam a post in the ground

and own what's below the surface dirt. To make a claim, mining companies must inform federal and state agencies that minerals are believed to be underground, pay a slate of fees, then begin a government application process that can last 10 years before a shovel hits the ground.

There are two types of mining claims:

- Lode claims cover veins of such mineralized rock as quartz, gold or other metallic minerals that have well-defined boundaries and broad zones. The Bureau of Land Management limits the size of a lode claim to 1,500 feet long and 600 feet wide. Lode claims tend to net the biggest payoff, as they produce year after year. Lodes can continue for many miles underground and contain yields in heavy concentrations.
- Placer claims give people rights to loose minerals, such as sand, gravel or gold that has eroded from rock and washed downstream. Many nonmetallic bedded or layered deposits, such as gypsum and high calcium limestone, also are considered placer deposits. The maximum size of a placer claim for a corporation is 20 acres. With placer claims, people can mine like prospectors — with a simple gold pan and water. Even large-scale operations can strike gold with metal detectors, sluice boxes and dredgers.



Did you know?

The United States was the third-leading gold producer in the world in 2014, meaning Nevada produced 5.4 percent of all the gold in the world.

INSIDE A MINE

- Nevada has both underground and open pit mines. The underground operations tunnel more than 1,000 feet below ground. Open pits resemble craters with dirt shelves that support trucks hauling debris from as deep as 1,000 feet.
- The hauling trucks that work inside open pit mines measure up to 60 feet long, can carry up to 400 tons and have 5,150 horsepower. Their tires are as tall as a house.
- Power shovels, controlled by a joystick, grasp dirt-covered minerals off of mine walls. Each can bite more than 50 tons.
- A mill site must be on non-mineral land. Its purpose is to support a lode or placer mining claim operation. The maximum size of a mill site is 5 acres.
- A tunnel site is where a tunnel is run to develop a vein or lode. It also may be used for the discovery of unknown veins or lodes.
- The average weekly wage for a miner in Nevada is \$1,973. There are about 13,300 mining employees in the state.

Did you know?

In 2014, gold mined in Nevada accounted for 72.8 percent of all the gold mined in the United States.

Did you know?

There are federally administered lands in 19 states, including Nevada, where the public can locate a mining claim or site.

CONCERNS ABOUT MINING

Many environmentalists worry about the impact of mining on natural resources and the environment, as well as the financial and political power of mining companies.

The Environmental Working Group, a nonprofit research organization based in Washington, D.C., found that the hardrock mining industry owns gold, silver and other precious metals and minerals beneath an estimated 2.5 million (continued on page 13)

ROCK TALK

(continued from page 12)

acres of U.S. public land in Nevada. The resources are worth millions of dollars a year, were acquired for as little as 84 cents per acre and are held in perpetuity for a yearly rental fee as low as 62 cents an acre, the group says.

Further, under a 132-year-old law intended to spur development of the West, the mining industry, dominated by a handful of multinational corporations, pays no federal royalties and leaves behind a landscape of dramatically diminished value, the environmentalists say.

Massive pit lakes hold contaminated water, hundreds of millions of pounds of chemicals have been dumped by mining operations into Nevada's water and air, and mines have destroyed forests, eliminated migration grounds and displaced wildlife.

Mining officials say they work hard to mitigate negative impacts associated with mining. For example, before ground is disturbed, companies must ensure that adequate funds are available to complete reclamation and remediation of exploration and mining sites.

To minimize harm to wildlife, operators use measures such as bat gates to allow bats into mines but keep humans and large animals out, and netting, fencing and "bird balls" to prevent birds and other animals from swimming in and drinking from chemical-laden ponds and ditches.

"Any natural resource extraction by definition impacts the environment," Nevada Mining Association officials say. "However, it is the manner in which these activities are carried out that is crucial in minimizing adverse effects."

Water also is essential to mining, but officials say companies minimize waste by recycling water, using salt water that's unsuitable for agriculture or household uses, and treating water and returning it to groundwater systems. Companies say they also work to minimize dust, smog and pollution associated with mining.

Q. How many mines are there in Nevada?

A. Less than 1 percent of Nevada's land houses mining operations. But the 167,000 acres that are being mined are spread across almost the entire state. Only Carson City and Douglas County have no mines. There are 110 mines in the state, and 2,230 companies connected to their operations. Four mines operate in Clark County. Nye County boasts the most mines — 21.

WHATS IN THE GROUND?

Most people know that gold and silver abound in Nevada. But there are at least 20 other minerals here that help make the state a leading mineral exporter.

- Gold: Used in jewelry, coins, dentistry, scientific and electronic instruments
- Silver: Used in currency, electronics, jewelry, batteries, cutlery, medical and scientific equipment
- Copper: Used in pipes, circuitry
- Lithium: Used in cellphones, electric car batteries, lubricants, rocket propellants
- Gypsum: Used in acoustical tiles, prefab wall board, building plaster, cement manufacturing, agriculture
- Lime: Used in stucco, asphalt, pH balancer
- Molybdenum: Used in alloy steel (to make it lighter, more rigid and less corrosive), auto parts, flame retardant
- Barite: Used in drilling muds, bowling balls, medical equipment
- Diatomite: Used in food and beverage filters, pool filters, cat litter, paint
- Petroleum: Used in diesel, kerosene, stove oil, asphalt
- Silica: Used in glass
- Clay: Used in cooking utensils
- Dolomite: Used in nutritional additives, building stone
- Lead: Used in batteries, protective coatings, soundproofing materials, ammunition
- Salt: Used in road de-icing
- Magnesite: Used in refractory materials, chemicals
- Perlite: Used in soil conditioner
- Sand and gravel: Used in concrete, bricks, roads
- Limestone: Used in concrete aggregate, fertilizer and soil conditioner, paints, plastics
- Sulfur: Used in sulfuric acid, fertilizer, chemicals, explosives, fungicides
- Tungsten: Used in electrical machinery, filament for light bulbs, textile dyes
- Zinc: Used in die casting, pennies, rubber, paints, automotive parts, electrical fuses

Did you know?

Gold is also used as a climate-controlling insulator. That's why developers of Mandalay Bay placed gold leaf on the resort's windows.

Activity Update

Mike Brady, January 2016

www.activityupdate.com

NEVADA

Corvus Gold Inc. announced that recent drill results at the North Bullfrog/Sierra Blanca Project include 86.87-184.4 meters @ 0.34 gpt Au (NB15-279); 187.45-198.12 meters @ 0.15 gpt Au (NB15-280); 134.11-137.16 meters @ 0.37 gpt Au (NB15-281) and 64.01-163.07 meters @ 0.64 gpt Au (NB15-282). (resource = 15,230,000 tonnes @ 0.37 gpt Au indicated) *Press Release: January 19*

Premier Gold Mines Ltd. announced that recent drill results at the McCoy-Cove/UPC Zone Project include 889.1-893.4 meters @ 12.81 gpt Au, 25.6 gpt Ag (PM15-09); 493.9-498.3 meters @ 7.20 gpt Au, 14.4 gpt Ag (PM15-10); 141.3-144.8 meters @ 7.72 gpt Au, 26.8 gpt Ag (PM15-13) and 418.8-420.0 meters @ 0.05 gpt Au, 8,740 gpt Ag (PM15-16A). (resource = 425,000 tonnes @ 10.46 gpt Au indicated) *Press Release: January 19*

Gold Standard Ventures Corp. announced that recent drill results at the North Bullion Project include 334.7-409.1 meters @ 1.68 gpt Au (RR13-13) and 296.9-315.2 meters @ 2.05 gpt Au (RR13-15). (resource @ Dark Star = 23,110,000 tonnes @ 0.51 gpt Au inferred) *Press Release: January 13*

Barrick Gold Corp. announced that one of its employees at the Cortez Mine was killed in a haul truck accident. (reserve = 153,821,000 tonnes @ 1.99 gpt Au proven+probable) *Press Release: December 29*

Rye Patch Gold Corp. announced that recent drill results at the Gold Ridge Project include 86.9-99.1 meters @ 0.44 gpt Au (GR-034); 71.6-83.8 meters @ 0.33 gpt Au (GR-035); 27.4-54.9 meters @ 0.35 gpt Au (GR-045) and 50.3-67.1 meters @ 0.24 gpt Au (GR-047). *Press Release: January 6*

Pershing Gold Corp. announced that recent drill results at the Relief Canyon Project include 101.7-120.12 meters @ 4.19 gpt Au (RC15-449); 1.82-17.14 meters @ 1.31 gpt Au (RC15-451); 212.94-220.22 meters @ 1.13 gpt Au (RC15-455) and 163.62-196.56 meters @ 1.54 gpt Au (RC15-456). (oxide resource = 33,561,000 tonnes @ 0.65 gpt Au measured+indicated) *Press Release: January 20*

Eureka Resources Inc. announced that it acquired an option to earn a 50% interest in the Gemini Property (Li) from Nevada Sunrise Gold Corp. for \$42,500 cash and 500,000 shares. *Press Release: January 21*

Levon Resources Inc. announced that it terminated its interest in the Norma, Sass, Ruf and Eagle properties of Coral Gold Resources Ltd. *Press Release: January 22*

Gold Standard Ventures Corp. announced that recent drill results at the Railroad/Pinion Project include 53.3-64.0 meters @ 0.38 gpt Au (PIN15-20); 321.6-373.4 meters @ 0.82 gpt Au (PIN15-21); 320.1-344.5 meters @ 0.57 gpt Au (PIN15-22) and 320.1-381.1 meters @ 0.40 gpt Au (PIN15-23). *Press Release: January 25*



Women's Mining Coalition 2016 Fly-In to Washington D.C.

Members of the Women's Mining Coalition (WMC) will be traveling to Washington D.C. for its 24th annual Fly-In for meetings on Capitol Hill during the week of April 17, 2016. The women work in the hardrock, coal and industrial minerals industries and for companies that provide goods and services to mining companies. Since its inception in 1993, WMC has made annual trips to Washington, DC to advocate for a robust U.S. mining industry and to discuss issues of importance to the domestic mining industry with members of Congress and Congressional staff.

The 2015 Fly-In focused on building support for Congressman Amodei's National Strategic and Critical Minerals Act of 2015 and the Stewart-Gardner Greater Sage-Grouse Protection and Conservation Act. As a result of the WMC meetings, additional co-sponsorships were obtained for both bills. WMC members also brought clarity to the concerns of administrative over-reach on issues like carbon emissions and ozone rules by the EPA and the stream buffer zone rule by the Office of Surface Mining. EPA CERCLA 108(b) financial assurance rulemaking was discussed with Hill staffers and members; such rulemaking is duplicative and unnecessary. WMC Fly-In participants asked members to support Congressman Gosar's Waters of the United States Regulatory Overreach Protection Act of 2015, which addressed concerns and uncertainties caused by the proposed rule (Definition of Waters of the United States' Under the Clean Water Act).

The 2016 WMC Fly-In will bring insight to the importance of modern mining, advocate for a strong and productive domestic mining industry, and showcase the professionalism of women who work in the mining industry. WMC's mission is to deliver the message to our legislators that a strong mining industry is vitally important to our nation, our communities, our families, and our livelihoods, and that today's regulations and modern technologies ensure responsible stewardship of our lands. WMC facilitates and provides the opportunity for our grassroots members to band together for a stronger voice with their congressional delegation.

If you are interested in hearing more about the Fly-In or would like to participate, contact Lynne Volpi, WMC Coordinator, info@wmc-usa.org.

ROCK TALK

(Seafloor vent—cont. from pg. 11)

many endemic species. “We’d expect there to be no magma whatsoever,” Hodgkinson explains, “so what’s powering this kind of activity? And what are the chemical consequences?”

During two different expeditions in 2010 and 2013 to the vents, the Southampton researchers tried to get answers, retrieving rock samples and developing high-resolution bathymetric maps of VDVF. When the remotely operated vehicle *Isis* returned to the ship after a day of sampling with a basket full of rocks, “the scientists would swarm around to get their samples,” Hodgkinson recalls, “bring them inside, take a photo, and do a quick description.” The more detailed analysis of mineralogy and rock precipitation history would be done back in the lab over the coming months and years.

Ultimately, the team found something remarkable: the dominant mineral was talc, a magnesium-rich silicate mineral perhaps best known for its softness and starring role in cosmetics products. It’s an unusual mineral to see at the seafloor, likely attributable the high pH values at VDVF (6) compared to those found at canonical black smokers (2-4). With a higher pH, the concentration of dissolved metals remains low, allowing silica to serve as a more prominent mineralogical player.

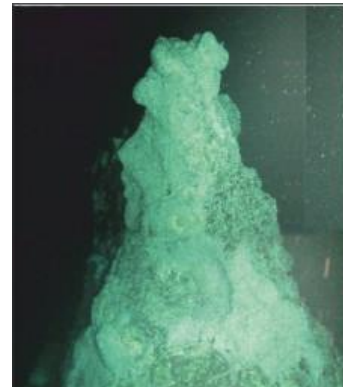
The heat source itself remains a mystery; the researchers are focusing in on fluid circulation and remnant heat from the lower crust / upper mantle that has been drawn up from depth by tectonic activity.

These putative deep-seated heat sources could allow slow-spreading systems to actually contribute disproportionately to the flux of heat from the mantle to the crust. Faster-spreading mid-ocean ridges have magma chambers close to the surface, restricting the amount of fluid circulation that can happen, but slow-spreading tectonic systems “allow fluids to percolate, and you can mine heat from deeper in the crust,” explains Hodgkinson.

Wherever the key ingredients of heat, fluid flow, and distinct chemical repositories are found, there are likely to be live-giving vents on the seafloor. And as we gain a broader perspective on seafloor processes, it seems that such systems are more diverse than ever imagined.

<http://blogs.discovermagazine.com/the-extremo-files/2016/02/08/191/#.VtYGAHz2aUk>

The study, titled “**Talc-dominated seafloor deposits reveal a new class of hydrothermal system**,” was published in the journal *Nature Communications* by Matthew Hodgkinson, Alexander Webber, Stephen Roberts, Rachel Mills, Douglas Connelly and Bramley Murton.



A talc-dominated spire found at the Von Damm Vent Field, a newly characterized type of hydrothermal vent. (Image: National Oceanography Centre)

OTHER UPCOMING EVENTS

1 MARCH 2016 Arizona Geological Society, Tucson AZ. Speaker: Dr. Peter R. Johnson, Retired Consultant. Title: “Tectonics and Mineral Deposits of the Arabian-Nubian Shield: Base-Metals and Gold in Earth’s Largest Mineralized Neoproterozoic Crustal Block”. . Sheraton, 5151 E Grant Rd. (& Rosemont), Tucson AZ 85712 . Sheraton, 5151 E Grant Rd. (& Rosemont), Tucson AZ 85712. Begins @ 6 pm. For more information visit the website: www.arizonageologicalsoc.org.

3 MARCH 2016 Nevada Petroleum & Geothermal Society, Reno, Nevada monthly meeting. Cocktails at 6:30 PM, Dinner at 7:00 PM, Ramada Reno Hotel; 1000 East 6th St., Reno NV 89512. Speaker: **Robert E Abbott, Geophysicist, Sandia National Laboratories, Albuquerque, NM. TOPIC: Geologic Characterization of Yucca Flat, Nevada, Using the Seismic Hammer™** Please RSVP by Tuesday, March 1, 2016. Please make reservations by using the following link: <https://docs.google.com/forms/d/1W426jEEAnaREY1h0qsbD57zVrXJFAj3IP1FN6z9aqfM/viewform>

6-9 MARCH Prospectors and Developers Assoc. of Canada—PDAC. Where the World’s Mineral Industry Meets. Toronto, Ontario. Go to the link to find out more information. <http://www.pdac.ca/convention>. **GSN in BOOTH #6502!**

14 MARCH DREGS, Denver Regional Exploration Geologists’ Society. Social hour: 6:00 pm, Presentation: 7:00 p.m. at CSM Berthoud Hall, Room 241, Golden, CO. Speaker: March 14: Chris Thiry, CSM Map Librarian on map resources inside and outside CSM. Contact James Piper for more information: geopros@q.com

14 MARCH Northern Nevada Section of SME Monthly meeting. Circus-Circus Mandalay Ballroom, Reno NV. Happy Hour @ 6 pm, Dinner starting at 7 pm. Presenter and Topic: To Be Announced. Dinner Cost \$30 per person-Members, \$35 per person-Non members. Please RSVP by Wednesday, March 9, 2016 to Brooke Miller NnevSME@gmail.com.

21-24 MARCH Colorado Mining Association 118th National Western Mining Conference & Exhibition. “Rethinking Strategies, Regaining Ground: Building Mile High Mining Opportunities”. Colorado Convention Center, 700 14th Street, Denver, CO. For more information contact Jody Gibbs at 303-575-9199 or email: JGibbs@coloradomining.org.

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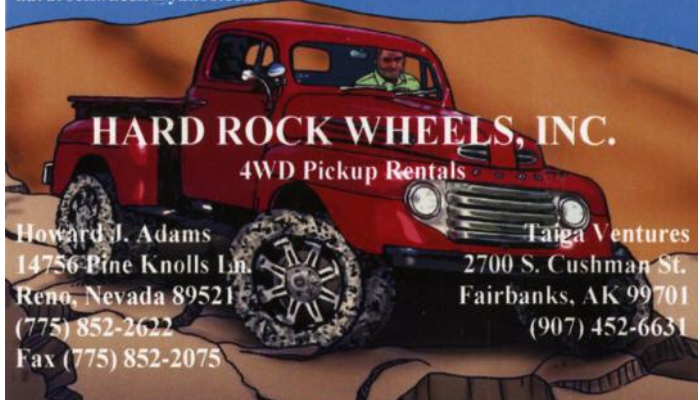
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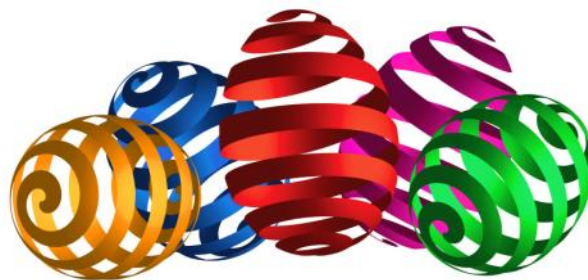
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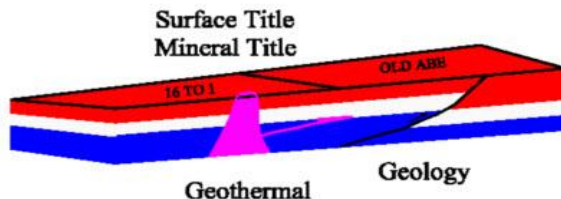
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