



Arizona Geological Society Newsletter

ARIZONA GEOLOGICAL SOCIETY, INC., TUCSON, AZ

MARCH 2011

March 1, 2011 DINNER MEETING

Kris Hefton of VANE Minerals, PLC will be our featured speaker. See abstract below.

Where: Sheraton Four Points Hotel, Wild Cat Room, 1900 E. Speedway Blvd. in Tucson

When: Cash Bar at 6 pm—Dinner at 7 pm—Talk at 8 pm

Cost: With reservation, members \$24, guests \$27, Students \$10.

Without a reservation, a \$3 surcharge will be added (if the hotel is able to accommodate you).

RESERVATIONS: CALL 520.663.5295 by 5 p.m. on February 25, 2011.

Please indicate low-salt, vegetarian, or vegan meal preferences. A coffee/salad/roll/dessert option is also available for \$18.

Please cancel if you are unable to attend. The hotel cannot guarantee that meals will be available without a timely reservation.

Exploration of Uranium-Bearing Breccia Pipes in Northwest Arizona

by Kristopher K. Hefton

While exploring for copper in 1893, Dan Hogan unknowingly discovered what would become the first solution-collapse breccia pipe uranium mine. Hogan staked and patented his Orphan Lode Claim over the unusual, isolated outcrop where he found copper. In 1951, uranium was discovered in the Orphan copper mine and subsequent study determined the origin of the occurrence.

Economic, uranium-bearing, solution collapse breccia pipes are unique to the southwest part of the Colorado Plateau. The pipes are formed by dissolution of underlying carbonate rocks resulting in the failure and collapse of overlying formations and subsequent upward stoping to the point of forming a cylindrical pipe. The stratigraphic range is the Mississippian Redwall Limestone to the Triassic Chile Formation. In the early 1970s, using the Orphan model, several uranium companies including Gulf Resources, Phillips Uranium, Noranda, and Western Nuclear commenced exploration. The indication that the district could overtake all other uranium regions in the USA in terms of grade, averaging near 1% U_3O_8 , set off an intense land rush. Early discoveries were made using aerial photography and satellite imagery to identify circular features. However, most of the easily identifiable pipes were found and efforts began to incorporate geophysics, geochemistry, and field mapping. Radiometric techniques have been used to discover a breccia pipe, but the presence of uranium at depth is not certain without drilling. The concern that not all pipes stope to surface and, therefore, may not be detectable, remains a serious exploration challenge.

To date, a total of 15 breccia pipe uranium deposits (+1M lbs U_3O_8) have been confirmed, for a total of 40M lbs of U_3O_8 . Twenty-three M lbs U_3O_8 have been produced from nine of these deposits. Although production and some exploration have resumed due to renewed interest in nuclear energy, the area is not undergoing activity on the scale seen earlier due to uncertainty cast by lawsuits and government agency decisions driven by special interest groups and politics. The lack of available geological experience in uranium also poses problems. The breccia pipe district represents an important strategic uranium resource for the USA and holds excellent potential for discoveries, despite the fact that the geology of these deposits is not completely understood.

Kristopher K. Hefton obtained a B.Sc. in geology from the University of Texas at Austin in 1978. His uranium exploration career on the Colorado Plateau began with Century Geophysical Corp. in 1976. He is presently a Director and Chief Operating Officer of VANE Minerals PLC, which is listed on the Alternative Investment Market (AIM) of the London Stock Exchange.

Kris spent nine years with the uranium exploration division of Energy Fuels Nuclear Inc. prior to joining Freeport-McMoRan in 1988. He later headed the mine site exploration team at Freeport's Grasberg mine in Indonesia. From 1997 to 2002 he managed exploration programs for Homestake Mining Co. and Barrick Gold Corp. in Europe and South America. He joined the VANE team in 2004. His combined uranium experience totals fifteen years.

Karen Sue Bolm Library Dedication

Friends and associates of Karen Sue Bolm gathered at the USGS office in Tucson on February 17 to dedicate the Karen Sue Bolm Library and to share their memories of a valued colleague. Karen's title at the USGS was Physical Scientist, but she was best known as the "Face of the USGS in Tucson" where one of her roles included public outreach and responding to public inquiries. Karen passed away in 2009. It was a huge loss for her family, the USGS, and the public with whom she interacted.

Bob Kamilli, AGS VP of Programs and the organizer of the event, described Karen's gift for dealing with the public and for finding obscure references, her role in the USGS's minerals resource database, and her later role as a GIS expert. Keith Long, Cori Hoag, and Tim Hayes described Karen as patient, pleasant, extremely competent, unflappable, and always willing to help in any way she could. Keith Long told the story of how a homeless man came into the office one day and stole Karen's lunch from her desk. She handled the incident with aplomb, saying, "He probably needed it more than I did."

Karen's husband, John, spoke last, saying that while Karen never liked being in the spotlight, she would have appreciated the dedication of the library in her name.

It takes a special kind of person to respond to public inquiries. Greta Orris recalls Karen's patience with a man who came into the office with a red rock that he had tripped over when leaving a bar. "He was convinced it was from Mars. Karen handled his inquiry respectfully and with patience while others might have rolled their eyes." Clearly, the USGS had selected the right person for the job.

Karen Bolm was an active AGS member, having served on the Executive Committee from 1991-1994 and 2001-2004.

The Karen Sue Bolm library is located on the first floor of the USGS offices at Park Avenue and 6th Street. It is a comprehensive collection of USGS documents, including plates and maps that are often missing from other libraries. A number of rare publications and periodicals are also in the collection. Anyone can use the library by appointment. It is a fitting memorial to a dedicated USGS employee who spent so much of her career disseminating this valuable information to the public.



This photo of Karen, one of her favorites, hangs next to the library entrance.



Bob Kamilli (left) chats with Coleen Brown at the informal gathering to dedicate the Karen Sue Bolm library.



John Bolm (second from left) enjoyed meeting with others who came to share their remembrances of Karen.

Field Trips!!!

AGS VP of Field Trips, Doug Shakel, reports that he is in the early stages of organizing an AGS field trip to Kartchner Caverns. Plans are very preliminary at this time. The tentative date is May 28. The cost will depend on whether transportation is provided or not. He will be announcing more information as the plans develop.

Doug is open to suggestions for other field trips.

GRAND CANYON RAFT TRIP

There has been a cancellation for the Grand Canyon raft trip on July 10-17, so we have an opening for **ONE** person. If you are interested, please contact Alison Jones at 520-622-3222 and she will give you the scoop. Stan Beus will be the geology leader for the trip, and Hatch River Expeditions is the outfitter. The total cost is \$2750, and includes all meals, camping equipment, helicopter flight out of the canyon, and plane flight back to Marble Canyon or Las Vegas. *This trip is a must for every geologist.* Our eight-day trip will take us from Marble Canyon to Whitmore Wash—a total of 188 miles—and we will observe some of the most spectacular scenery, geology, and anthropological sites that the Grand Canyon has to offer.

Editor's Note: The Membership Spotlight column will resume next month. Our subject will be John Bolm.

Announcements

2011 DUES REMINDER!! AGS dues are payable on January 1. If your dues are outstanding, you should have received an invoice by email. Please remember to send in your dues soon or pay at the March 1 dinner meeting.

In Memoriam

Condolences to the family of **James D. Sell** who passed away on February 18, 2011 in Tucson. He was an exploration and mining geologist/manager with ASARCO and a member of AGS for more than 40 years, serving as Treasurer (1965), Councilor (68-71), President (73), and Past President (74). Jim was a native Arizonan, and a graduate of the University of Arizona, where he earned both his undergraduate and graduate degrees in geology. He is survived by his wife Marnie and his two grown children. A memorial service will be held at St. Andrew's Episcopal Church, 545 S. 5th Ave., Tucson at 2 p.m. on March 5.



Deer Creek in Grand Canyon. Photo credit: Alison Jones

