

# DIXIE GEOLOGICAL SOCIETY



## NEWSLETTER APRIL 2010

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### APRIL DGS MEETING

This month, George Condrat ([Loughlin Water Associates LLC](#)) will give an “**Assessment of the Silver Creek Sink Holes, Park City, Utah.**” A sinkhole appeared along Silver Creek in spring of 2008 in Park City, Utah. The feature is comprised of openings in bedrock, subsurface caverns, and an irregular-shaped depression in soil and mill tailings formed by erosion of the soil and mill tailings into the bedrock caverns. The bedrock caverns occur in north-dipping bedrock and were apparently caused by dissolution of carbonate rock along bedding planes and groundwater flow along a major fault.

The 2008 sinkhole is located about 200 feet west of a sinkhole that appeared and was subsequently plugged in 1982. Both the 1982 and 2008 sinkholes captured the entire flow of Silver Creek.

During December 2008, the Utah Division of Oil, Gas, and Mining (DOG M) Abandoned Mine Land Reclamation Program plugged the main visible opening of the 2008 sinkhole and a smaller opening. However, new openings quickly formed nearby that continue to capture the flow of Silver Creek.

We performed a three phased investigation of the sinkhole area for the Snyderville Basin Water Reclamation District, which owns a wastewater trunk line which parallels Silver Creek and passes within 100 feet of the 2008 sinkhole and about 50 feet of the 1982 sinkhole. The purpose of the study was to assess the threat to their trunk line that is posed by the sinkholes. The studies included gathering historic information, air photo review, surface observations, ground penetrating radar (GPR) and seismic refraction tomography surveys, and rock coring using “sonic” drilling techniques at geophysical anomalies.



Investigations proceeded in a phased approach because of the small size of the caverns and difficulty of interpreting site conditions.

The studies concluded that the sinkholes do not pose a short-term threat to the trunk line. However, other concerns related to the presence of the sinkholes include impacts of continuing loss of stream flow to fish and wildlife, irrigation and other water uses; hazards to humans and animals of the an open sinkhole and occasional deep ponding at the sinkhole; continued erosion of alluvium and mill tailings into the subsurface and potential impacts to groundwater quality; the severe difficulty of addressing subsurface contamination in the event of a spill or contaminant release into Silver Creek above the sinkhole; and potential rock collapse due to continuing subsurface erosion and dissolution of bedrock.

The 2008 sinkhole lies on property owned by the Utah Division of Parks and Recreation. The Utah Division of Water Resources has initiated design of a sinkhole plugging program. Although there appears to be no clear funding for a plugging program at present, a number of public entities have expressed interest in participating.

George Condrat is a geological engineer with more than 35 years of consulting experience specializing in groundwater hydrology and engineering geology. He has performed and managed a wide range of investigation, feasibility study, designs, construction, operation and maintenance for environmental facilities and earth structures. Projects have included water supply wells, geologic hazards, soil conditions and foundations, rock excavation, slope stability, ground water contamination assessment, and remediation systems for removal and containment of contaminated soils and ground water. Currently, with [Loughlin Water Associates LLC](#), he focuses on ground water supply development, although he gets to work on other interesting projects like the Silver Creek sink holes. He holds a Professional Degree of Geological Engineer from the Colorado School of Mines and a BS degree in Mining Engineering from the University of Utah. He is registered as a Professional Engineer in Utah, Colorado, Idaho, New Mexico, Wyoming, and Arizona and as a Professional Geologist in Utah.

This meeting will be on our regular meeting date (third Thursday) – **April 15, at 7 PM**, but we will ***not*** be in our usual meeting space! Instead, we'll be two doors to the west in **room 117** of the Dixie State College Science Building. If you're not familiar with the DSC campus, there's a map [here](#) (the Science Building is building #6, near the top center of the map), and there's a map of the building [here](#). Directions to the campus and building are:

- Exit 8 (1<sup>st</sup> St. George exit from the north);
- Turn west at light (if coming from the north, don't stay in the right-most lane or you'll be forced to turn!);
- Turn left on 700E;
- Turn left on 100S;
- Once on 100S, pass through the stoplight for the crosswalk, and turn right just past the light into the parking lot. You'll be in front of the Science Building. Park and come in the main entrance.

As always, the meeting is open to anyone -- please bring friends, students, and anyone you know with an interest in geology.

## **APRIL PRE-DGS MEETING DINNER & DRINKS**

For anyone that would like a pleasant evening out prior to the meeting, we'll be gathering at 5:30 PM at our old haunt, Iggy's Sports Grill some food and imbibery! Iggy's is at 148 South 1470 East (basically, head east across River Road on 100 South, and it'll be on the right side as the road curves south). If you plan to be there, please RSVP to [me](#) by the evening of Wed., Apr. 14 so we can be sure to secure a table big enough for all to share.

## **BRECCIA PIPES IN ARIZONA**

In July 2009, Interior Secretary Ken Salazar proposed a two-year withdrawal of about 1 million acres of Federal land near the Grand Canyon from future mineral entry, and announced the two-year study of these one million acres to decide whether or not to withdraw these lands from new mining claims for an additional 20 years. The lands, managed by the

Bureau of Land Management and U.S. Forest Service, are within portions of the Grand Canyon watershed and contain significant environmental and cultural resources as well as substantial uranium deposits.

The USGS has released a report of its findings:

Alpine, Andrea E., ed., 2010, Hydrological, geological, and biological site characterization of breccia pipe uranium deposits in northern Arizona: U.S. Geological Survey Scientific Investigations Report 2010-5025, 353 p., 1 pl., scale 1:375,000 (<http://pubs.usgs.gov/sir/2010/5025/>).

The breccia pipes of the Arizona Strip contain significant uranium reserves, and are important for both United States energy independence, and the economies of Kane and Washington Counties.

## **GEO-HUMOR**



(sculpture by Ito Hirotohi)

With smiles like these, they *must* be stoned...!

'Til next time...!

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