



Hydrogeology of the Onondaga Valley Aquifer -- The Good, the Bad, and the Brine

Presented by William Kappel (US Geological Survey)

May 20, 2004

The natural brine-filled aquifer that gave Syracuse the nickname "The Salt City" could possibly confound the clean-up of Onondaga Lake unless the characteristics of this aquifer system are understood. The U.S. Geological Survey is presently studying the Onondaga Valley aquifer in conjunction with the Onondaga Lake Partnership to identify the source of brine and define its movement and concentration within the aquifer. The aquifer lies within the Onondaga Creek valley and extends from Tully north to Onondaga Lake and beyond. The results of the 4-year study should provide the data needed to discern whether the brine from the aquifer discharges into the lake and whether it might affect the cleanup of the lake and its bottom sediments. Water-quality and drillhole data indicate that the aquifer system in the Tully valley has a limited hydraulic connection to the Onondaga valley aquifer system. Data indicate that concentrations of sodium chloride in the unconsolidated aquifer are from 3 to more than 5 times as salty as seawater. This chemistry of the brine indicates that it is probably derived from beds of halite in the Syracuse Shale, but how these brines got to where they are found today has yet to be determined. While the brine is most highly concentrated in the main valley, salty water of variable concentration also occurs in some tributary valleys but has a different chemical signature – more of a deep-basin brine quality. Drillholes in Onondaga Lake indicate a thick sequence (~175 ft) of fine-grained, post-glacial sediments above the glacial sediments. Presumably, brine under artesian pressure slowly diffuses through these sediments and discharges upward into the lake through these lake-bottom sediments. Isotope data indicate that the brine to be appears to be of glacial to post-glacial origin – dates range from 24,000 years BP (before present) to 10,000 years BP.

Presenting March's talk is William Kappel of the U.S. Geological Survey in Water Resources Division, Ithaca New York. Mr. Kappel has been with the USGS since 1979 and specializes in water-resource investigations. Mr. Kappel's investigations include aquifer mapping studies in upstate New York and approximately 10 years of ground-water study in the Niagara Falls region. More recent investigations include the hydrogeology of the Tully Valley and mudboil activity, the 1993 LaFayette mudslide, and the Retsof Mine Collapse - Genesee Valley Aquifer study team. Current investigations

include Onondaga Valley Aquifer study -- movement of natural brines to Onondaga Lake, and the study of small aquifer systems in the Tug Hill Plateau.

Meeting logistics: The meeting will take place on Thursday, May 20, 2004 in the Kenyon Hollow room of the Skyline Lodge at Highland Forest. A social/hiking hour will be from 5:30 p.m. to 6:30 p.m. The dinner will start at 6:30 p.m. and our featured speaker, William Kappel of the US Geological Survey, will begin his program at 7:30 p.m. The cost of dinner is \$12 for members, \$15 for non-members and \$12 for student members. Please RSVP by Monday, May 17, 2004 to Bonnie at Parratt-Wolff via e-mail at bolney@pwinc.com or 437-1429.

Directions: From Syracuse take I-81 south to the exit for Tully (Exit 14). Turn left at the end of the off ramp and then the next left onto Rte. 80. Follow Rte. 80 east for about 12 miles to the entrance road to the park. At the main parking area turn left past the park office and follow the signs to the Skyline Lodge.

NYSGS Seeks Bedrock Core from Syracuse Area: The New York State Geological Survey is involved in a state-federal cooperative program of bedrock and surficial mapping in Onondaga County. Next year's efforts will include mapping in the Silurian rocks north of the Onondaga Escarpment, specifically in the Camillus and Syracuse West quadrangles. The outcrop exposure will not be plentiful in these rocks, hindering geological interpretation, and mapping in the Syracuse metropolitan area presents additional difficulties. Consequently, NYSGS is looking for core of the bedrock in the aforementioned quadrangles. If your company has drill core in the area of interest that could be examined by our bedrock mappers, we would greatly appreciate knowing of it. Please contact the Bill Kelly, Acting State Geologist and Chief, NYSGS at 518 474-5816 or email wkelly@mail.nysed.gov. We appreciate your support.

CNYAPG 2004 – 2005 Board of Directors: This is your chance to vote for the 2003 – 04 board of directors. An official ballot is included on the following page of this newsletter. Please take the time to support our organization and send in your completed ballot to CNYAPG, P.O. Box 567, Dewitt, NY, 13214.



BALLOT FOR 2003 - 04 BOARD OF DIRECTORS

The CNYAPG Board of Directors is pleased to announce the following candidates for the 2004 -05 Board of Directors. Please cast your vote for the person whose name appears on the ballot or any other person you wish to nominate for that position. Even if you are voting for only those candidates whose names appear on the ballot, we encourage your participation in the voting process. Upon completion, please send in this ballot to:

CNYAPG
P.O. Box 567
DeWitt, NY 13214.

If you prefer, you can bring your completed ballot to our May 20 meeting no later than 6 p.m. Your completion of this ballot and participation in the future of our organization is greatly appreciated!

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