

MEMORANDUM

To: Groundwater Advisory Council
From: H. Bokuniewicz
Re: Minutes of the meeting of 4 June 2007
Date: June 5, 2007

PRESENT

R. Alvey
H. Bokuniewicz
S. Colabufo
S. Jones
R. Liebe
R. Mazza
D. Paquette
A. Rapiejko
K. Roberts
W. Spitz
L. Swanson
S. Terracciano

REGRETS

M. Alarcon
N. Bartilucci
L. Koppelman
M. Nofi
G. Proios
K. Willis
P. Witkowski

1. The minutes of the last meeting were distributed. Andy Rapiejko's name was inadvertently left off the attendance list and the minutes will be revised. There were no other comments at this time but corrections can be sent to me.
2. Flooding problems around Lake Ronkonkoma were discussed. There is a suggestion to alleviate mounds in the water table and lower lake levels by dredging and channelizing streams in the vicinity. This would enlarge the capture area but it seemed unlikely to some that this would have a regional effect especially if the goal is to depress the water table by several feet. Stream flow records should be checked to see if the base flow has been decreasing as might be due to infilling over the years.

Dredging fine-grained sediment from Lake Ronkonkoma has also been proposed. The lake, however, is ground-water fed and although the hydraulic gradients are higher in the east than they are in the west, it's not clear that improving transmission through the lake floor would significantly improve the situation. The lake probably goes through long-term changes in water level of several feet over a decade. We're at an historically high level. Pumping associated with the drainage control to the north of the lake could be of sufficient magnitude to affect lake levels on the order of several feet.

3. Larry Swanson discussed recent research into polluted conditions in the Forge River. This work began a year ago as a cooperative effort between the DEC, the Town of Brookhaven, the County and the University to look into the problem of

eutrophication and recommend solutions. Originally, the sediment were thought to be the source of both organics and metals perhaps due to historical duck farming, in which dredging could be a solution. Source control would be needed in addition for dredging to be a practical solution. In addition, dredging would have to be widespread and would only be effective to the extent that the sediments are the source of contamination.

There is historical data going back to the 1950's to show a long-standing problem with eutrophication but, at that time phosphorus, probably from duck farms, was the problem. The County has been purchasing duck farms on their development rights and the active farm now is taking measures to control wastes. These days the problem seems to be nitrogen. Nitrate enters the system from upstream, groundwater seepage and its release from sediments. There was a clay layer encountered under the river that may block the upward flow of groundwater but seepage appears to enter the river horizontally from its tributaries. Nitrogen in wells near the river reaches concentrations of 10 mg/l. Measurements in August found levels of dissolved oxygen near zero at daybreak; blue crabs were seen agitating the water as they "gasp for breath". During the day the bottom water remain anoxic but surface-water oxygen concentrations become supersaturated due to algal photosynthesis. Ulva is also present now but was not present in the 1950's. Ulva is an indicator of eutrophication and was a driving force behind concerns in Hempstead Bay (South Shore) changes in sewage treatment. The impacts are greater in the west side where there is high density residential development; the population has more than doubled since the 1960's. All are on septic systems and, because the water table is close to the surface, sewage is most likely reaching the Forge River. Bruce Brownawell is hoping to quantify this phenomenon using tracers of septic waste like, perhaps, caffeine or whitening agents. Boron or chloroform might also be considered for tracking sewage plumes. Condominiums on the east side are served by "package plants" for sewage treatment but it is uncertain how effective these actually are. Some PHHs are likely to be from historical wood-burning rather than current sources and a "milky white" substance sometimes seen in the water is likely to be elemental sulfur liberated by the extreme reduced conditions. Sewering would be a way to reduce the groundwater source of nitrate, but residents hope to avoid sewerage however, because of the tax burden.

4. Ron Paulsen discussed the SCDHS study done over the past few years of Mega Laundromats (a word that seems to have been coined by Bill Spitz). These are facilities that can have 100 or more machines and operate 24-hours a day, seven days a week. Effluent discharge can exceed 80,000 gpd. These tend to be found where there is a large workforce and perhaps, inadequate private septic systems. Not only do they provide a substantial large waste water flow than conventional Laundromats but the treatment can be more complex.

Methylene Blue Activated Substances (MBAS, which are surfactants) from laundromats had been common in Islip and Babylon before sewerage years ago and foaming from wash water waste plumes was seen. In 2004, several private wells in Shirley had detections of MBAS (and other contaminants). This population has now been switched over to public water. Clean-up of MBAS is difficult since the waste stream tends to clay charcoal filters. The plume should reach the Carmen's River in a few years. It appears to be 30 to 40 feet thick, down from the water table and 50 to 100 feet wide.

Contaminants include DEET, Ammonium, semi-volatiles including pharmaceuticals, Diethylphthalate, Benzophen, Mn, Fe and VOC's. DEET also shows up at golf courses; people spray their clothes with it and them through the wash. Ammonium is high; there is presently no standard but it is considered in surface water so, perhaps, a groundwater standard will be imposed in the future. Perchlorate was tested for but not found (below 206 ppb). Ammonia and Mn were found at high levels; they were probably not in the source at these high concentrations (19 ppm for Mn) but stripped off the aquifer material by reducing conditions in the plume.

Two other sites were examined, one in Farmingdale and one in Medford (the latter is in the 50-100 year capture zone for a public supply well 5-21247 off of Route 112).

Zoning code for Mega Laundromats is being set based on parking hours of operation, number of machines, and volume of effluent. Groundwater quality is not a specific criterion, in part, because many of the chemicals of concern are not federally regulated as toxic although they may be for aesthetic reasons, and there are no regulations for these contaminants in septic systems.

In conclusion, the mega laundromats have impacted private wells and surface waters, but regulating effluent discharge may not be feasible or easy to get compliance. Is treatment of waste even possible? Mega Laundromats appear to be discharging numerous contaminants of concern – not just MBAS. We don't know at this point the affects of some of these contaminants (pharmaceuticals, plasticizers . . .) Are they harmful? Some appear to be in capture area of public supply wells.

5. The symposium seems to be under control. All the speakers have been contacted concerning the tight time constraints and Doug has made arrangements for coffee and the poster sessions. Many of the speakers have sent their presentations in ahead of time. We are not intending to publish proceedings but presenters will be asked to allow their presentations (or some modifications of their choice) to be posted on a web site.
6. Gil Hanson was honored for his lifetime achievements in geochemistry at the International (Joint) Meeting of the Geophysical Union, representing 12 professional organizations. Gil has worked all over the world from the Alps to Antarctica. His invited, keynote presentation was titled "Quantitative Modeling of Cations in a Sewage Plume in Groundwater" and prominently acknowledged the support of the SCWA.
7. There will be no meetings over the summer. Probably the next meeting will be late September, but I will send out a schedule as soon as the academic calendar is set.