

BUNNELL, JOESEPH, U.S. Geological Survey, Geologic Discipline, Reston, VA, and REBECCA BUSHON, U.S. Geological Survey, Water Resources Discipline, Ohio Dist Microbiology Laboratory, Columbus, OH, WILLIAM OREM, ROBERT FINKELMAN, U.S. Geological Survey, Geologic Discipline, Reston, VA, BRADFORD HANSON, Louisiana Geological Survey / LSU, Water Resources and Environment Section, Baton Rouge, LA, DOUGLAS CARLSON, RUNHUA SHI, Louisiana State University School of Medicine, Shreveport, LA, OTHERS TBA

### **Investigating a Possible Link Between Water From Aquifers Containing Lignite Deposits and Kidney Disease in the USA: Louisiana Project**

In May 2002, 15 wells and four surface water sites were sampled, and in September 2002, those same wells and sites plus four additional surface sites were sampled in five parishes of northwestern Louisiana. A geographic information system (GIS) was used to select residential water wells for sampling. Well water samples were analyzed for pH, conductivity, organic compounds, and nutrient and anion concentrations. All samples were further tested for presence of fungi (maintained for up to 28 days and colonies counted and identified microscopically), and metal and trace element concentration by inductively-coupled plasma mass spectrometry and atomic emission spectrometry. Surface water samples were tested for dissolved oxygen and presence of leptospiral bacterial presence. A polymerase chain reaction protocol was optimized for detection of pathogenic leptospires, and the sensitivity of the assay was ascertained. The Spearman correlation method was used to assess the association between the endpoints for these field/laboratory analyses and cancer of the renal pelvis incidence obtained from the Louisiana Tumor Registry. Significant associations were revealed between the cancer rate and the overall number of organic compounds, the fungi Zygomycetes, the nutrients  $\text{PO}_4$  and  $\text{NH}_3$ , and thirteen chemical elements (As, B, Br, Cl, Cr, F, Li, Na, P, Rb, Se, Sr, W) from the well water as compared to the controls. Among the species of fungi from the total of 136 isolates were 12 *Penicillium* spp., at least two *Aspergillus* spp., a number of other genera (*Alternaria* sp., *Eupenicillium lapidosum*, *Cladosporium* sp., *Epicoccum* sp., *Trichoderma* sp., *Paecilomyces* sp., *Chrysosporium* sp., *Chloridium* sp.), and Zygomycetes, and Coelmycetes -- some of which are known mycotoxin producers. The two control wells yielded a mean of 6.5 (SD = 3.5355) individual isolates, while the mean number of isolates from all other sites was 7.6 (SD = 4.4866). Presence of human pathogenic leptospires was detected in 4/8 (50 percent) of the surface water sites sampled. These initial results suggest that additional investigation is warranted.