

UNITED STATES DISTRICT COURT
DISTRICT OF COLUMBIA

KARST ENVIRONMENTAL EDUCATION)
AND PROTECTION, INC.,)
WARREN COUNTY CITIZENS FOR)
MANAGED GROWTH, GAYLA CISSELL,)
JIM DUFFER and ROGER BRUCKER)
)
Plaintiffs) No. 1:05-cv-01190-RMU
)
v.)
)
U.S. ENVIRONMENTAL PROTECTION)
AGENCY,)
U.S. HOUSING AND URBAN)
DEVELOPMENT,)
and TENNESSEE VALLEY AUTHORITY)
)
Defendants.)

* * * * *

SECOND DECLARATION OF DR. MICHAEL T. MAY

I, Dr. Michael T. May, make the following declaration based on personal knowledge, information, and belief:

1. Qualifications.

a) I have three degrees in geology with the third being a terminal degree of the Doctor of Philosophy and I am a tenured, Associate Professor of Geology in the Department of Geography and Geology at Western Kentucky University (WKU), located in Bowling Green, Kentucky. Although as a professor I am exempt from professional registration, I became registered because of my consulting and public practice of geology beyond my duties at WKU.

b) I am a registered professional geologist in the Commonwealth of Kentucky (KY- 2342) via the National Association of State Boards of Geology (ASBOG) exam and a licensed professional geologist in the state of Indiana (license no. 1654).

c) I am an active member in Karst Education & Environmental Protection, Inc. (KarstEEP).

d) I have been involved with the Kentucky Society of Professional Geologists (KSPG) since 1996, the year I accepted a tenure-track academic position at WKU. Presently, I am President-elect of the KSPG and will take over as President of the organization in 2006.

e) I have studied the karst terrain of Kentucky since coming to WKU in 1996, as an example, I published results in the peer-reviewed journal *Environmental Geosciences* where I chronicled karst groundwater pollution at a Kentucky military installation that was one of the many sites undergoing the Base Realignment and Closure process. I have also been active leading or co-leading field trips in karst, including one scheduled for October 2005 for the National Meeting of the American Institute of Professional Geologists (AIPG) to the Mammoth Cave region.

f) In 2004, I was awarded the Ogden College of Science and Engineering's Public Service Award at WKU. The vast majority of my public service entailed educating school groups on karst (through KarstEEP) and other environmental issues, attending and participating in planning and zoning hearings on the transpark, as well as volunteering for being on the City of Bowling Green's Storm Water Advisory Committee. My testimony before the Warren County Planning Commission on several occasions mostly from 2002 to 2003 was in regard to my concern over the concerted effort on the part of the proponents of the Kentucky Trimodal Transpark to address issues pertinent to the National Environmental Policy Act, in particular, those of an environmental nature dealing with geology and hydrogeology. I was a key member of the storm water committee (2002-2003) and presented a lecture on karst issues as a way of educating the city's committee on what they would have to deal with to be in compliance. The storm water committee was established in response to EPA's Storm Water Final Rule Phase II program and the listing of Bowling Green, KY in the Federal Register as a community in need of being in compliance with the Clean Water Act.

g) I am an expert in sedimentary geology including the detailed study of limestones, their origin, associated secondary mineralization, their dissolution or karstification, and their diagenesis (chemical, volumetric

and mineralogical changes). Limestone underlies the whole site in question.

h) Prior to my academic career I was employed by a company who was a prime contractor for EPA Region VII in Kansas City, Kansas. My main duties included evaluating and scoring sites for potential National Priority List (NPL) status, as well as conducting third-party oversight of groundwater monitoring and remedial operations for various environmental sites including military installations, industrial sites and mining and smelting sites in several states. One of the largest sites I was a project manager on was the Galena, Kansas former mining and smelting site (subsite or part of the Cherokee County Superfund site), located on karst terrain in southeast Kansas.

i) I am an expert in subsurface correlation of sedimentary rocks, core description and in general, an expert in geologically characterizing sites. My expertise in subsurface geologic characterization was gained via not only through my two graduate school experiences (University of Kansas and Indiana University - both areas underlain by limestone and the latter in a karst area as well) but also through intensive industry training through my employment at Exxon U.S.A., Inc. in Midland, Texas from 1985 to the end of 1988 and through employment with Shell Western Exploration & Production, Inc. (Shell Oil) in Houston, Texas from 1992-1993. Many of these courses and the day-to-day work projects dealt with geophysical methods for characterizing subsurface conditions such as thickness and continuity factors in rock strata, as well as rock porosity and permeability and fluid flow dynamics.

j) Since the late 1990s, I have co-taught a week-long short course on environmental regulations for the University of North Carolina once or twice a year for persons employed in governmental, industrial, defense and private sectors including the U.S. State Department, USEPA, Dow Chemical, U.S. Navy, ship builders, power companies, transmission companies, etc. This course focuses on CERCLA, RCRA, NEPA, CWA, CAA and similar issues.

k) I have authored a number of technical reports for clients as a private consultant and working for a company hired as a prime contractor for the USEPA. I have recently been retained for litigation support and as an expert witness in cases involving sedimentary geology and

groundwater flow. In two of these cases, the first bedrock encountered on the sites in question is limestone exhibiting karst features.

I am providing this declaration as a volunteer without compensation. I have read the Second Declaration of Nicholas Crawford, PH.D., P.G., dated August 18, 2005, and the declaration of Mr. Allen Heidel, ITA Operations Manager, dated August 23, 2005.

2. Environmental Harm from Transpark Construction.

Dr. Crawford states that, "It is my opinion (sic) there has been no measurable negative impact on Graham Springs during the construction of Bowling Green Metalforming, LLC at the Transpark." Dr. Crawford (para. 7.-8.) and that "To my knowledge there has not been a significant amount of clay and silt that has washed into sinkholes during construction at the Transpark site."

There is no evidence to my knowledge that there has been established by Dr. Crawford (para. 8) or others under his direction any pre-construction, or post-construction monitoring of clay and silt suspended sedimentation rates or quantities in either the karst swallets or sinkholes on the TVA-funded Bowling Green Metalforming site, in caves discovered on the subject site (some by accident and others certainly not by geophysics), or downstream at the rise of the Grahams Springs karst groundwater basin at the confluence with the Barren River.

As I indicated in my initial Declaration, in my professional opinion, there has already been a negative impact on the Graham Springs karst groundwater basin which drains under the industrial complex already constructed for TVA-funded Bowling Green Metalforming. Most of this damage would be in the form of mobilization of fine-grained materials of clay and silt size into the subsurface karst conduits. Mobilization of fines is known to have negative impacts on fauna in both karst and surface waters. During construction at the site, I witnessed that silt fences had done little to protect the watershed, as numerous sinkholes and solution-enlarged fractures were illegally plugged with multiple loads of trucked in rip-rap limestone blocks and then back filled with mostly clayey soil on the site. Many fine-grained materials obviously went into the subsurface.

Surface modification of the karst drainage network has already resulted in changes to the subsurface flow network. This was particularly evident during construction of the Metalforming site where I have seen aerial photos of holes opening up due to regolith (soil arch) collapse into karst systems that obviously had undergone a changed flow capacity due to surface modification (see Exhibit 1).

I was informed by a KarstEEP member that observations made during flyovers of that area during construction proved that abundant suspended load is issuing from the rise/spring that certainly drains the subject site. I have seen a photo of the Graham Springs karst groundwater basin discharge point into the Barren River taken on May 17, 2004 (included in Exhibit 1), during construction of the Bowling Green Metalforming facility that clearly shows damaging suspended load impacts not only to the karst system issuing out of the ground but to the surface water as well. Again, the impact or potential impact due to suspended-load sedimentation on water quality, endangered mussels, and similar biota in the downstream area has been ignored. To my knowledge there has been no quantification or even screening of suspended load sediments by Dr. Crawford or anyone on behalf of Intervener ITA. The "monitoring" that Dr. Crawford refers to is apparently just a visual check by a Bowling Green employee of the presence and physical condition of the silt fences.

Dr. Crawford (para. 7) also states "The water quality monitoring that the CCKS has performed at Graham Springs during construction does not indicate a measurable negative impact." However, he does not provide any evidence of hard monitoring data, even as an exhibit. This absence of submitted data calls into question the scope and quality of the data, if indeed collected, e.g., what water quality parameters were measured? Were they chemical, biological, or sedimentological in nature? Also, he does not define "measurable." For example, if filter-feeding endangered or threatened species in the Barren River adjacent to the Graham Springs karst groundwater basin rise (photo) have taken in excessive suspended sediment loads during construction of the Bowling Green Metalforming site, there would be a "negative impact," but not "measurable" if one is only measuring non-biological impacts rather than biological impacts.

I also believe there will be future negative impacts to the Graham Springs karst groundwater basin. For example, where storm water retention ponds have been constructed, numerous sinks have been plugged and these will surely open up in the future and could potentially decrease water quality and perhaps even flood dry cave passages that harbor rich archaeological remains as well as ecological resources including many threatened and endangered species. To the best of my knowledge, there has been little or no discussion on the part of the proponents about the types of chemicals, fluids, solids, etc. that holding basins or tanks at the Bowling Green Metalforming site (a manufacturer of sports utility vehicle frames) or other sites that may become part of the Transpark. In particular, I am concerned about both sinking contaminants - Dense Nonaqueous Phase Liquids (DNAPLs) as well as floating contaminants - Light Nonaqueous Phase Liquids (LNAPLs). There have not been any models that I am aware of where proponents hydrologists have modeled the behavior of these in the Graham Springs karst groundwater basin should a release occur. I am not aware of any Bowling Green-Warren County Planning and Zoning Commission hearings on rezoning of the Transpark during which I testified and heard Intervener ITA and its consultants testify where this issue was addressed by the ITA. I presented a conceptual model of some of these DNAPL concerns under oath and this is part of the rezoning record, but the ITA did not want to engage in any discussion on the matter.

This is all the more reason to look at a total potential impact for chemicals of concern to be released from various proposed industrial process sites. This would go far beyond mere consideration of stormwater run off, which in my opinion, is the only groundwater contamination issue the Intervener ITA and its consultants, including Dr. Crawford, have explicitly directed resources toward from the inception of this proposed project. Minimally, there should be a review of Material Safety Data Sheets (MSDSs) for chemicals and materials proposed to be used at the Bowling Green Metalforming site.

Before there is modification of additional hundreds of acres in the Grahams Springs karst groundwater basin, the watershed should be investigated adequately. Likewise, there should be a complete analysis of the four pathways of potential concern - air, groundwater, surface water (to which karst waters discharge such as the Barren River), and

soil/rock. This has not been completed heretofore in detail relative to what should be conducted for a project of this proposed size of 4,000 plus acres.

Again, full documentation of the hydrogeologic conditions both on the subject site and downstream are needed, and this can only be afforded via an EIS. I also disagree with the categorical statement that soil erosion from agricultural practices on farmland in the area will necessarily be much worse than an industrial site. There are many farmers being taught about Best Management Practices (BMPs) and they are using them in the area, this includes practices such as no-till and installing and managing grass buffer strips around sinkholes and swallets. Without baseline studies of suspended load sediments traveling through the karst system, statement's such as Crawford's "...construction at the Transpark site would be almost insignificant and probably less than when the land was used for row crop agriculture." has little merit.

3. Potential for Contamination of Mammoth Cave National Park by Spillover or Reverse Flow from the Barren River and Graham Springs Basin.

Dr. Crawford states that "...groundwater from (the Transpark site) flows to Graham Springs on the nearby Barren River and that no imaginable flood event could result in water from the site flowing over its headland drainage divide and into Mammoth Cave National Park...More research has been performed and more is known about the Graham Springs and Turnhole Spring (Mammoth Cave) groundwater basins and how they respond to storm events than any other large karst groundwater basin in the world."

I have read the official report of the Mammoth Cave National Park Hydrologist, in response to the Center for Cave and Karst Studies (ITA's consultant, led by Dr. Nick Crawford. The Park's Chief Hydrologist concludes that **"At this time, the existing data are too limited in scope and accuracy to conclude that a flow reversal or spillover does not exist...We believe that the possibility for a spillover or flow reversal (does exist) (emphasis added)."** The failure to secure more comprehensive data in an Environmental Impact Statement (EIS) is the crux of this action.

I have also read Mr. Allen Heidel's declaration (ITA Operations Manager) and his reference to early studies conducted on behalf of ITA such as those conducted by Wilbur Smith Engineers and the LawGibb Group. These studies are troubling considering that it is apparent that the geologic and hydrogeologic conditions at the site were misunderstood from the beginning and that proposals were made to rectify a "potential karst problem" associated with Quinlan and Ray's (1981) groundwater flow map. These consultants even made a "buffer of caves" zone for the proposed airport runway alternative plans following inferred, karst dye-trace trajectories not actual caves.

To the best of my knowledge, according to Dr. Crawford's second declaration his work at this site (para. 2) has "dealt with groundwater flow and methods for preventing groundwater contamination..." This is not geology, it is hydrology, and if it is hydrogeology, his emphasis in my opinion has been on hydro not geology. In short, it is my opinion that he has not sufficiently characterized any of the subject area geologically by drilling, correlating subsurface well logs, porosity or permeability trends in the limestone, or other pre-existing data, nor has he acquired any new geologic data. This lack of detailed geologic characterization I believe reflects the need for a full-blown EIS, especially considering the projected size of this industrial site.

In my professional opinion, there has not been adequate assessment of geologic characterization at the Kentucky Trimodal Transpark, including the "Phase I" industrial park, which includes the Bowling Green Metalforming facility, partially funded by the Tennessee Valley Authority, nor has there been sufficient collection of data and evaluation by qualified professionals to address the issue of whether there is hydrogeologic communication and under what events between the Graham Springs Karst Groundwater Basin and Turnhole Springs, the headwaters of Mammoth Cave National Park, such that the Park's karst and surface water system could be harmed by contaminants from the Transpark.

4. Endangered Species Act.

Threatened and endangered species as mentioned in ITA Operations Manager Allen Heidel's declaration (para 7), which I have read, are emphasized as being only worthy of

protecting within the confines of Mammoth Cave National Park but the law is protective of these species anywhere that they are found. This suggests to me that proponents of the Transpark and their agents have not understood the Endangered Species Act or similar acts. If an EIS was conducted, there would be a proper assessment of threatened and endangered species in the subject area and environmental mitigation could occur but without an EIS, it is feared that many species will not be documented or protected.

Mr. Heidel's declaration (para. 21) states that the ITA contractor found no endangered species in the cave but there was no mentioning of any potential downstream threatened or endangered species throughout the Graham Springs Karst Basin into the Barren River. If an EIS was conducted, the downstream waters both in the subsurface and on the surface would be assessed.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on this _____ day of _____ 2005.

DR. MICHAEL T. MAY

EXHIBIT 1
AERIAL PHOTOS