

P. O. Box 539
Ophelia Va 22530
March 16, 2005

Peter Gold
3WP12, EPA
1650 Arch Street
Philadelphia PA 19103

Dear Mr. Gold:

As a retired scientist, president of a local stewardship organization <www.napsva.org> and oyster gardener, I have been interested in the issue of shellfish harvesting restrictions for several years. I have attended the two DEQ public presentations on this issue in Northumberland County. My opinion on the issue, after a considerable but not exhaustive perusal of the peer-reviewed scientific literature, and discussion with microbiologist colleagues, is that there is no proof of the source of the bacteria. MST (or BST if you prefer) has potential for the future, but to quote 2004 Env. Sci. Tech 38:6109-6117 "The results of this study indicate that current protocols for isolate subtyping may be insufficient to accomplish many goals of MST....." Conclusions based on state-of-the-art MST would certainly not hold up in court at this time.

There is abundant circumstantial evidence that the bacteria are primarily of wildlife, not human or pet, origin. For example, only the headwaters of the creeks are restricted, certainly because of lower salinity. The headwaters of the creeks are much less developed than the mouths of the creeks, and some are completely undeveloped. I compared two creeks off the Potomac River in Northumberland County using VDH Shellfish Sanitation data for two years. 2001 was a drought year and 2003 was a very wet year. Cubitt Creek has 29 "911 addresses" or septic systems, whereas Hull Creek has 101. There is a statistically significant difference between the two years, with the expected result that there are higher bacterial levels in 2003. There is no significant difference between the two creeks despite a difference in the number of septic systems of more than a factor of three. Additionally, there is no evidence in VDH data, dating back to about 1972, that bacterial levels have increased over time, despite the large increase in the number of waterfront homes (septic systems) and pets. All these observations are circumstantial, but they all favor the hypothesis that the bacterial contamination is due to wildlife, not humans.

No reliable data favor widespread contamination by humans. Additionally, it is known that the anoxic bottom muds in the creeks harbor the indicator organisms, which may get stirred up by boat wakes and storms. In effect, it seems the creeks may have been inoculated with bacteria at some time in the past. If inoculation of the bottom muds took place in the past, and continual "re-infection" of the water takes place, then there is nothing that can be done about the situation, just as is true if wildlife are the primary source of bacteria.

EPA requires Va DEQ to address the impairment due to bacterial contamination. Two points are relevant:

- 1) It may be that the contamination is due to current wildlife or past human/wildlife contamination, and if so, nothing can be done about it. Insufficient data exist to demonstrate unequivocally that continued human contamination is responsible for high bacterial levels. Why is DEQ being required to do something that is likely impossible, namely to address an unproven source of impairment?
- 2) The creeks are impaired because of high nitrate and phosphate loads, mostly from groundwater contaminated by agricultural practices. Bacteria as a cause of impairment are a very minor problem compared to eutrophication. Chesapeake Bay is formally impaired because of a high nutrient load. Why are small waterways like Cubitt Ck, Hull Ck, the Little Wicomico River, the Coan River, Cockrell Creek, etc. not similarly impaired because of high nutrients, and only, additionally, because of high bacterial levels? I measured dissolved oxygen concentrations in the Little Wicomico last summer and found, as expected, that a pycnocline had developed and that the water below the pycnocline contained less than 2 mg/l dissolved oxygen. At 7 feet of water depth, the water was not "fishable" according to the Clean Water Act, and it is no wonder that the oyster grounds in the vicinity are mostly dead. Bacteria had nothing to do with the hypoxia, and neither Dermo nor MSX caused oyster mortality because oysters grow well in surface floats, including those at my pier. Low oxygen levels were caused by excessive nutrient input. Why is DEQ not being required to do something that is very doable, namely to address a proven source of impairment,

overloading by nitrate and phosphate? For your information, the groundwater in Northumberland County contains about 5 mg/l nitrate (see the Stewardship Tip on Shallow Groundwater at www.napsva.org), nearly identical to groundwater from the Delmarva Peninsula, known "...to be among the highest in the Nation (USGS Circular 1228. p. 2). Agricultural fertilization, especially the use of animal waste, an extremely inefficient form of fertilizer, is the major source of nutrients that contaminate the groundwater, which then discharges into the creeks. Runoff is a very minor problem in this setting because most rain infiltrates our porous soils. I measure nitrate levels in the discharge from my drainfield, located 200 feet from an arm of the Little Wicomico River. Given the maximum nitrate concentration I have ever observed, 5 mg/l, and water usage (approximately 100 gal/day/person), my drainfield discharges less than one pound of nitrate each year to the creek. Compare this to a field fertilized with sewage sludge at 400 pounds of nitrogen/acre to grow a crop that requires only 120 pounds of nitrogen/acre (using Va. Dept. Conservation and Recreation "Nutrient Management Standards and Criteria"). There are about 4000 homes with septic systems in Northumberland County and roughly 35,000 acres of cropland, confirming the overwhelmingly dominant role of agriculture in polluting local waterways in Northumberland County. Why is EPA not directing resources to address this important issue now, rather than wasting resources to address an issue (bacterial contamination) that is likely inactionable and plays no role in the real reason for impairment, namely eutrophication, of local waterways or the Bay?

If you will kindly send me your mailing address, I will provide you with a letter, for the record. Feel free to pass my concerns "up the ladder" as you see fit. I intend to pursue this until the three questions posed under #1 and #2 are specifically answered to my satisfaction. It is my belief that current EPA policies waste my tax dollars and do not address the most important issue.

Yours sincerely,

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cc: Chester Bigelow, DEQ
Rep Jo Ann Davis
Ann Jennings, CBF