

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: July 25, 1995 FILE REF: 3200

TO: Paul Strom, Unit Leader - WR/2

FROM: Beth B. Goodman, Env. Toxicologist - WR/2 *BBG*

SUBJECT: Water Quality Criteria for Arsenic at the C.D. Besadny Wildlife Area: Data Exceed Safe Levels

I am providing the following initial assessment of water quality criteria for Arsenic at the C.D. Besadny Wildlife Area (CDBWA), based on the site information provided to me by Pat Trochlell and Tom Janisch, and my own review of Arsenic hazard and exposure materials. **Current levels of arsenic in the surface waters exceed safe levels for 1)human health, 2)wildlife and 3)aquatic life protection, by as much as 18,000 times.** I have also explored the literature and asked individuals at EPA about sediment or soil values of Arsenic which may be related to harmful effects in wildlife, but at this point, I believe that useful studies relating to soil standards for wildlife may be nonexistent. For wildlife protection, restoration of the surface water to NR 105 standards, and absence of leaching from nearby soils/sediments due to cleanup of soils to human health standards will be the best assurance that wildlife are not suffering adverse effects.

NR 105 ARSENIC CRITERIA

ARSENIC LEVELS @ CDBWA

Human health:	50 ug/L	
WDAC:	32 - 50 ug/L	up to 920,000 ug/L
Aquatic life:	153 ug/L	

All Wisconsin counties have <5ug/L of Arsenic in their water supply (Arch. Environ. Health, 1994). The NR 105 human health water quality criterion (50 ug/L) is currently identical to EPA's national Maximum Contaminant Level (MCL) for drinking water. After many years of review, EPA will likely propose a new drinking water MCL below 5 ug/L in November 1995. The point here is that the Arsenic criterion may, if anything, be underprotective. Another route of human exposure to arsenic at the Besadny Wildlife Area may be human consumption of wildlife. EPA's 1980 human health water quality criterion for consumption of aquatic organisms living in Arsenic-contaminated waters is **0.175 ug/L, lower than that for drinking water.**

As we have discussed, chronic arsenic poisoning in animals (outside of the laboratory) is rarely seen. Arsenic poisoning in most animals is usually acute or sometimes sub-acute, with animals surviving several days at most. Although NR 105 currently does not contain a Wild & Domestic Animal Criterion (WDAC) for Arsenic, I have used it as guidance to determine the protective WDAC range of **32-50 ug/L.** Toxicologists at both Michigan DNR and EPA - Duluth have independently calculated these same values for wildlife protection.

Finally, in the attached 1988 report, the US Fish & Wildlife Service suggested that the current national freshwater aquatic life criterion for Arsenic (and therefore the NR 105 chronic aquatic life criterion at **153 ug/L**) may be under protective. At 40 ug/L, death and malformation of toad embryos occurs.

Regarding current wildlife impacts, it is rather obvious that the water quality criteria are well exceeded, and wildlife should be discouraged from using this "wildlife area." At this point in time, I have heard numerous conflicting opinions expressed about the feasibility and necessity of doing

wildlife sampling at the site. Trying to collect wildlife may be a double-edged sword. Since toxicity is acute, death may be almost immediate & predators or water movement will carry away dead animals. Also, the burned out vegetation may possibly discourage use of the area by some wildlife. There should be no need to "prove" the contaminated levels are adversely affecting wildlife; laboratory studies have well-documented that exposure at levels far lower than at this area are not safe. Unfortunately, even if wildlife carcasses are recovered from the site, lack of good tissue residue data will make it difficult to prove that Arsenic was the cause of death. In past ad hoc discussions, both Kathy Patnode and I have tried to discourage spending lots of staff time trying to locate carcasses. We have agreed that any dead wildlife should be collected for potential future analysis. If some sort of field monitoring is absolutely necessary, then perhaps a mesocosm study (caged fish, tadpoles, etc) could be performed in the ponds on site. However, as stated earlier, **current levels of arsenic in the surface waters exceed safe levels for 1) human health, 2) wildlife and 3) aquatic life protection, by as much as 18,000 times.** Given EPA's water quality criterion for consumption of aquatic organisms living in Arsenic-contaminated waters, people should probably be discouraged from eating wildlife from this area.

Please let me know if there is more information you would like me to provide. I would like the enclosed materials returned when you are finished with them. Thanks.

cc: (w/out enc)

Pat Trochlell - WR/2
Tom Janisch - WR/2
Lee Liebenstein - WR/2
Jim Reyburn - LMD
Kathy Patnode - WM/4
Bob Strous - SW/3

To: →