

**Saginaw-Tittabawassee Rivers Contamination CAG
CAG Retreat
Memorial Park, Freeland MI
Monday, May 15, 2017
6:00 PM – 8:30 PM
DRAFT**

CAG Members Present

Peter Bagley
Michael Kelly
James Krogsrud
Joe Kozumplik
Luis Mulford
Terry Miller
David Sommers
Joel Tanner

CAG Members Absent

Drummond Black
Charles Curtiss
Leonard Heinzman
Jim Koski
Bryce Wakeman
Laura Ogar
Bob Wiese

Ex-Officio Members Present

Joe Victory, Michigan DEQ
Todd Konechne, Dow Chemical

Support Staff Present

Doug Sarno, Facilitator
Diane Russell, EPA

CAG information, materials, recommendations, meeting summaries, and presentations provided at CAG meetings can be found at: <http://www.saginawcag.org>

Doug Sarno called the meeting to order at 6:15 PM. Agenda items included:

- 2017 Membership Applications
- Michigan State University Superfund Research Program (SRP) Updates
- EPA Community Involvement Update

2017 Membership Applications

The membership committee presented four applications for membership to the CAG and recommended that all four be accepted. The CAG approved the slate of four candidates unanimously. The following new members are invited to join the CAG for a three-year term beginning July 17, 2017.

- Pamela Binder
- Murry DeSanto
- Kevin Quiggle
- Virginia Thibodeau

Project Updates

Todd Konechne, Dow Chemical provided the update.

We are targeting the September meeting date for a tour of the River, weather and water levels permitting.

Segment 4 and 5 were combined into a single decision document last year. Segment 4 will be the focus this year, and Segment 5 work will begin next year. There will be both floodplain and bank work, and there is no in channel work in segment 4.

The plan to begin the first bank in the next few weeks, we will need to watch water levels to be sure it is low enough to conduct the work.

Michigan State University Superfund Research Program (SRP) Updates

Overview of MSU's National Institute of Environmental Health Sciences (NIEHS) SRP Project and the MSU Center

Dr. Norbert Kaminski, Director institute of Integrative Toxicology provided this presentation.

The MSU Center Coordinates research, graduate work on toxicology across campus, and is one of 24 research centers under NIEHS across the country. It has a broad mandate to conduct research. This research includes:

- Methods and resources to detect hazardous substances in the environment
- Improve techniques to assess the effect of hazardous substances on human health
- Methods to assessing risk on human health.

The research is restricted to a select list of environmental contaminants (dioxin and dioxin compounds are on the list). The Research is thematic, multidisciplinary and basic as well as applied

The theme for the MSU program is on dioxin and dioxin like compounds. It includes 4 biomedical projects, 2 remediation engineering projects, and core facilities for research and community engagement.

We work with 25 investigators from MSU, EPA, and four other universities.

Collaborative research efforts on activated carbon and its potential use for remediation of dioxin-like compounds

Dr. Brian Teppen presented this project. He works with a team of lab chemists on this project. The molecular structure of dioxin and furans provides for connection to either chlorine or hydrogen. These compounds are hydrophobic and persistent in the environment. They are not soluble in water but stick to soils.

Dioxins come from institutional processes, incineration, and natural fires and we see them mostly in soils and sediments. 2008 research hypothesized that black carbon in the soil was important in binding dioxin like compounds. Studies showed that the dioxins in urban soil from Midland were 28% bioavailable to rats and 16% bioavailable to young pigs.

The goal of this study is to look at separate mineral/organic components of soils and determine bioavailability of dioxins/furans in each.

Both clay and activated carbon sorb dioxins, and we wanted to see what happens when the sorbed dioxin is consumed.

We used corn oil, clay, sand (silica), and activated carbon (burnt pieces of coal, wood) and put an equal distribution of dioxin in each one and fed them in identical doses to mice.

We then evaluated the immune function over different concentrations of exposure and witnessed the following results:

- Corn Oil showed direct reduction in immune function as concentrations increased as expected
- Sand also showed direct reduction in immune function as concentrations increased
- Clay showed direct reduction in immune function as concentrations increased
- Activated carbon showed NO toxic response in immune function as concentrations increased, the dioxin was apparently so tightly bound to the activated carbon that the mice were not affected by the dioxin.

Summary

- Sorption does not equate to loss of bioavailability to mammals as demonstrated by clay and silica studies, where the dioxin was just as available.
- Sorption to Activated Carbon eliminates bioavailability of dioxins to the mammals.

The bottom line is that it's not how much TCDD is present, but in what form is it present. Only the soil black carbon fraction binds the compounds tightly enough to make them unavailable to mammals.

CAG Question: could you use carbon to put it into the soil to help sorb them?

Answer: Possibly, you could rototill the carbon in

CAG Question: could you have the mice eat activated carbon?

Answer: This has not been studied, but it would seem unlikely, the carbon passes right through

CAG Question: how are mice extrapolated to humans?

Answer: There are some similarities and some differences with humans, we are studying how well these models work

CAG Question: how does this compare with other studies that have been done?

Answer: Quite a bit of the limitation on bioavailability has been contributed to soils, but did not identify the specific fraction of the soil that contributes to this.

CAG Question: Did you look at other impacts beyond the immune system?

Answer: We measured immune system and also looked at some other impacts on different parts of the body, but the concentrations that were left in the bodies was too small to measure, the vast majority of dioxin just passed through the bodies.

CAG Question: How did you get the mice to eat these different compounds?

Answer: There is a process to ensure controlled amounts are injected into their systems.

CAG Question: is the clay similar to that found here in the river?

Answer: Yes, we took this type of clay and purified it to ensure that it would hold dioxin the strongest.

CAG Question: So what happens with these results?

Answer: Other researches are looking at this. Activated carbon is pretty inexpensive to produce and there are field trials being conducted all over the world including in the Pacific Northwest and New England. This includes working it into soils and sediments or spraying it on in some manner.

CAG Question: do we know that introducing a lot of activated carbon is harmless?

Answer: Good question, in our studies the activated carbon did not affect the mice in the short term. From a chemical standpoint, it is not a toxic material. When we have

delivered dioxin in our experiments, we have delivered known amounts. We don't really understand how effective activated carbon will be in sorbing dioxins in a natural environment. The lab is a very controlled environment. There are still a lot of questions around this.

Dow: The way dioxins originally got put into the river is that the furans were already attached to graphitic carbon particles. Dow has looked into this and has put some carbon down on their property to understand how it gets distributed in the soil and how it might or might not work. We don't have any results yet.

All of these field trials are just research projects in seeing how this might work.

CAG Question: have you done any experiments with fish and bioaccumulation?

Answer: No. There are some studies in the literature with invertebrates (worms and similar creatures).

CAG Question: Are you looking at any other compounds that might help degrade or bind dioxin?

Answer: We are looking at some things that help to reduce the chlorine on dioxin compounds, but these are really hard to reproduce outside of the lab.

CAG Question: Are we to assume that immune system impacts are one of the key concerns with humans?

Answer: Yes, but remember that dose makes the poison and we are still looking at what are the concentrations for human exposure.

CAG Question: Are you doing other research for use with black carbon?

Answer: Yes, there are other contaminants that also seem to bond to black carbon.

EPA Community Involvement Update Summary for 2016 Activities

Diane Russell, EPA, provided this update.

EPA first opened its field office in Saginaw in 2009. EPA employs general outreach to inform the public, conducts project specific outreach and also works through a cooperative agreement with Michigan Department of Public Health to coordinate with local partners to provide the public information about fish and wild game advisories.

Goals are to provide the public accurate, timely, and understandable information needed to understand the project and fully participate. EPA gives full consideration to the public input we receive and we assist the public in understanding project decision making and the community role.

There are numerous outreach materials that we use including our community involvement plan, a local office (now in Flint), the CAG, public meetings and events, emails, newsletters and fact sheets, and other materials.

If you have any information needs or know of events where EPA should participate, please let us know.

Key results since opening the field office in Saginaw office include over 200 distinct outreach events. This office moved to Flint last year and now serves multiple sites throughout Michigan.

The MDCH cooperative agreement is to make sure that exposures to local fish and wild game are communicated effectively and that local organizations and health professionals have the information that they need. Since 2011, this program has distributed 170,000 Eat Safe Fish brochures.

Areas of focus for 2017 include continuing our engagement for cleanup activities, general outreach and our work under MDCH. We are also supporting work with local high schools in the area. We will not have a formal public meeting this year as we combined segments four and five in the proposed plan last year so will not have a new proposed plan.

EPAs website is changing and can be found at:
www.epa.gov/superfund/tittabawassee-river

The EPA field office is located at 1300 Bluff St., Suite 140, Flint MI 48502

Diane can be reached at Russell.diane@epa.gov, 989-395-3493

CAG Question: what have you heard from the river walkers?

Answer: They collect a lot of information and do provide detailed reports.

CAG Question: Does it seem they are being successful in changing behaviors on eating bottom feeders?

Answer: That is difficult to gauge as people are not always honest in their responses.

Public Comment

There was no public comment.

The meeting adjourned at 8:00 PM.

The next CAG meeting is July 17, 2017