COMMONWEALTH OF PENNSYLVANIA
HOUSE OF REPRESENTATIVES

ENVIRONMENTAL RESOURCES AND ENERGY
COMMITTEE HEARING

STATE CAPITOL
IRVIS OFFICE BUILDING
ROOM G-50
HARRISBURG, PENNSYLVANIA

WEDNESDAY, DECEMBER 16, 2009
9:38 A.M.

PRESENTATION ON SEWAGE SLUDGE

BEFORE:
HONORABLE CAMILLE "BUD" GEORGE, MAJORITY CHAIRMAN
HONORABLE BRYAN BARBIN
HONORABLE MIKE CARROLL
HONORABLE H. SCOTT CONKLIN
HONORABLE EUGENE DePASQUALE
HONORABLE R. TED HARHAI
HONORABLE TOM HOUGHTON
HONORABLE DAVID R. KESSLER
HONORABLE STEVEN J. SANTARSIERO
HONORABLE TIM SEIP
HONORABLE JOHN T. YUDICHAK
HONORABLE SCOTT E. HUTCHINSON, MINORITY CHAIRMAN
HONORABLE MARTIN T. CAUSER
HONORABLE JIM CHRISTIANA
HONORABLE GARTH D. EVERETT
HONORABLE MATT GABLER
HONORABLE JEFFREY P. PYLE
HONORABLE KATHY L. RAPP
HONORABLE CHRIS ROSS
HONORABLE RANDY VULAKOVICH

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ALSO IN ATTENDANCE:
HONORABLE BARBARA McILVAINE SMITH
HONORABLE RUSSELL H. FAIRCHILD
HONORABLE JERRY KNOWLES
HONORABLE DAVID R. MILLARD
HONORABLE MERLE H. PHILLIPS

COMMITTEE STAFF PRESENT:
E. THOMAS KUHN
MAJORITY EXECUTIVE DIRECTOR
EDWARD P. YIM
MAJORITY LEGAL COUNSEL
DEAN GHOWERI
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REPORTER

I N D E X

TESTIFIERS

SUBMITTED WRITTEN TESTIMONY

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P R O C E E D I N G S

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CHAIRMAN GEORGE: This meeting will come to order.

I apologize that the schedule of the House has brought about where we have had to consider moving this hearing up a half hour.

I am most grateful for those that, even though they have other meetings, they are here to participate in this most important discussion.

I will start by -- I'll just hesitate a moment; we have other members coming in -- by allowing the members to introduce themselves to our guests and our participants. If you will just yield a moment.

We will start at the lower, the first row, start with the gentleman, Mr. Conklin, and go to his left, please.

REPRESENTATIVE CONKLIN: Scott Conklin, Centre County.

REPRESENTATIVE SEIP: Tim Seip, representing part of Berks and part of Schuylkill Counties, the Cabela's and Yuengling district.

REPRESENTATIVE GABLER: Matt Gabler from Clearfield and Elk Counties.

REPRESENTATIVE RAPP: Kathy Rapp, 65th District, Warren, Forest, and McKean Counties.

REPRESENTATIVE VULAKOVICH: Randy Vulakovich, Allegheny County.

REPRESENTATIVE CHRISTIANA: Jim Christiana, Beaver County.

REPRESENTATIVE PYLE: Jeff Pyle, 60th Legislative District, Armstrong and Indiana Counties.

And this may be the first time I have ever been to the left of Conklin.

REPRESENTATIVE HOUGHTON: Tom Houghton, southern Chester County, and it's a very rural district with five old boroughs, so this hearing is of good interest to me.

REPRESENTATIVE SANTARSIERO: Steve Santarsiero, Bucks County, 31st District.

REPRESENTATIVE YUDICHAK: John Yudichak, Luzerne County.

REPRESENTATIVE CARROLL: Mike Carroll, Luzerne and Monroe Counties.

REPRESENTATIVE BARBIN: Bryan Barbin, Cambria County.

REPRESENTATIVE ROSS: Chris Ross, Chester County.

REPRESENTATIVE KESSLER: Dave Kessler, Berks County.

CHAIRMAN GEORGE: Camille George, Clearfield County.

REPRESENTATIVE HUTCHINSON: Scott Hutchinson, Venango and a portion of Butler County.

REPRESENTATIVE EVERETT: Garth Everett, Lycoming County.

REPRESENTATIVE CAUSER: Marty Causer, McKean, Potter, and Cameron Counties.

CHAIRMAN GEORGE: First I want to thank the gentleman, Representative Kessler, for all his work in putting this together.

Last month when the committee decided to conduct this hearing and to solicit testimony on alternate applications for biosolids other than the land application of sewage sludge, I was optimistic that session would be finished for the year.

I was too optimistic, unfortunately. Because of the unknowns of this week's legislative schedule, I felt it was somewhat prudent to start the hearing at 9:30 rather than 10 o'clock and finish at 11, where we go back into session.

In 1992, the Environmental Protection Agency modified its standards which regulate the application

of sludge on lands. The new regulations used the term "biosolids" for the first time, and "sludge," which was previously designated as a "hazardous waste," was reclassified as a "high-quality fertilizer." But changing the name of "sludge" to "biosolids" does nothing to ensure the public safety.

I have been at the forefront of this fight in Pennsylvania since young Tony Behun of my district, a constituent, died in 1994 at 11 years of age after riding his bike through the mud at a mine reclamation site near his home.

What Tony thought was fresh mud was sewage sludge. Eight days later, in the Pittsburgh Hospital, Tony died of a blood infection from a bacterial pathogen listed by the EPA as presenting a public health risk and present in sewage sludge.

I have been told that there are safer alternative uses for biosolids. Consequently, I approach today's hearing with an open mind and look forward to the testimony that we will receive.

I turn to my Co-Chairman, the gentleman, Mr. Hutchinson.

REPRESENTATIVE HUTCHINSON: Thank you, Chairman George.

Certainly there are many facets to the uses of and alternative uses of biosolids, both in Pennsylvania and nationwide, and I look forward to exploring some of those issues today in this hearing.

And thank you for having us meet today.

CHAIRMAN GEORGE: I thank the gentleman.

And if you will allow me, I would like to introduce the gentleman, Mr. Kessler, who worked very hard in bringing this meeting about.

REPRESENTATIVE KESSLER: Thank you.

First of all, I would like to thank Chairman George for allowing me to coordinate the presenters.

The presenters today I have visited and talked to for the last year, and I'm looking forward to hearing them share the information that they have shared with me with all of us.

Thank you.

CHAIRMAN GEORGE: And if we will and you will find this acceptable, we will start. And I apologize if I do not pronounce the names accurately, but our first presenter will be the gentleman, Mr. Andy McElmurray, a farmer from Hephzibah, Georgia.

Would you come forward, please.

MR. McELMURRAY: Chairman George and honorable members of the committee, thank you for the honor of testifying today about the destruction of my family's dairy and row-crop farming business by hazardous waste in sewage sludge which was land applied by the city of Augusta, Georgia.

Also, I will be testifying why in my opinion the current Federal sewage sludge land application regulation 40CFR503 is not safe.

My name is Andy McElmurray. I'm a third generation dairy and row-crop farmer from Hephzibah, Georgia.

I would like to add here, and it is not in my written testimony, but we farmed approximately 3,000 acres of row-crop land. We milked 525 head of Holstein cattle. During the course of the damages, we lost approximately 300 head of cattle that died above the Georgia State average, the Georgia State average death rate for dairy farms there.

We also culled, which is called a culling rate in the dairy business, we culled approximately 350 head above the normal State average.

I have been involved with a team of attorneys and experts for the last 11 years in an effort to recover compensation for damages of my

family's farming business which resulted from hazardous wastes in Augusta, Georgia's sewage sludge.

The city of Augusta invited us to participate in its land application program and assured us that the sludge was safe for growing crops.

On our farm we grew forage crops to feed our dairy cattle. We grew row crops as well. In 1998, after hundreds of heads of cattle sickened and died, we learned that Augusta sewage sludge contained extremely high levels of hazardous waste that were toxic to dairy cattle.

Another prize-winning dairy farmer in the area, owned by the family of Bill Boyce, was hit just as hard, and he lost everything.

Our families have farmed our land for three generations. We have lost millions of dollars in property value, property, and agricultural products.

On February 25, 2008, U.S. District Court Judge Anthony Alaimo ruled that the U.S. Department of Agriculture must compensate my family and me for crops that could not be planted because our fields were too contaminated with hazardous chemical wastes from Augusta's sewage sludge.

Our dairy, which was once one of Georgia's most productive dairy farms, was destroyed by the heavy metals, PCBs, chlordane, and other hazardous wastes that local industries dumped into Augusta's sewer system.

Why sewage sludge cannot be safe under 40CFR503:

You need to know the regulations that control the production of sewage sludge, which are the Clean Water Act and Resource Conservation and Recovery Act.

In 1976, Congress enacted the Resource Conservation and Recovery Act, RCRA, controlling all solid waste from cradle to grave; i.e., from the time they are created until the time they are destroyed or safely sealed and permanently buried.

"Hazardous wastes" include toxic chemicals, radioactive materials, and biological or infectious wastes that meet certain criteria for being dangerous and potentially harmful to human health or the environment. They can be liquids, solids, contained gases, or sludges.

You need to understand that industrial hazardous waste is controlled under RCRA while it remains in the industrial pipeline leaving the

industry until it is deposited into the municipal sewer line. Once it is deposited into the municipal sewer line, it is controlled under the Clean Water Act and is no longer a hazardous waste. This process is deemed to be the domestic sewage exclusion.

This is the first failure of the regulations to be protective of human health and the environment. By some magic, industrial hazardous waste became nonhazardous by changing pipelines.

The domestic sewage exclusion circumvents RCRA by not allowing industrial hazardous waste to be tracked from cradle to grave as Congress mandated. This is a scheme by certain high-ranking EPA employees in the Office of Water to disguise industrial hazardous waste disposal. This scheme saves industry billions of dollars a year in the disposal of industrial hazardous waste.

The waste mixture in the wastewater treatment plant is controlled by the Clean Water Act. The effluent water leaving the plant is controlled under the Clean Water Act. The sludge produced is now controlled under RCRA because it is considered a solid waste.

Industries can dump up to 33 pounds of hazardous waste per month without any pretreatment to

a municipal sewer. Industrial hazardous waste must be pretreated if it is in excess of 33 pounds before being discharged into a sewer line.

Without enforcement and oversight of pretreatment standards, the industry can dump any quantity or quality of industrial hazardous waste into domestic sewers, which creates a dangerous and hazardous sewage sludge.

Each industry is issued an industrial permit by the municipality of what quantity and quality of industrial hazardous waste can be discharged into the municipal sewer. These industrial permits cover many industrial hazardous wastes, which are listed in 40CFR302.4.

The current Federal regulation, 40CFR503, only requires that nine heavy metals be tested for in the sludge. There are many other heavy metals outside the nine that are dangerous.

For example, we found antimony and thallium at high levels in our soils. These levels were above the Georgia Hazardous Site Reporting Act standards, which creates a complex legal situation.

Also, Ewers, 1988, states that thallium "is easily taken up by plants through the roots and thus enters the food chain" and that the main route of

exposure is via food.

Thallium was found present in 15 percent of the sludges tested in a national sewage sludge survey at levels varying up to 210 parts per million -- U.S. EPA 1996b.

In a recent sewage sludge survey by the EPA, thallium was found in 80 of 84 sludges tested -- the Targeted National Sewage Sludge Survey EPA-822-R-08-016. This is one of many examples of why 40CFR503 is not safe.

Molybdenum, Mo, is a heavy metal that can be detrimental to cattle. When 40CFR503 became law, we had both a ceiling concentration limit of 75 ppms and a lifetime loading limit of 18 pounds per acre.

Shortly after 40CFR503 became law, Climax Metals Company and several other companies engaged in Mo production used in process activities filed a petition with the U.S. Court of Appeals for the 10th Circuit seeking a review of the land application numerical limits for Mo.

Because of the petition, the EPA removed the lifetime loading limit of Mo with total disregard for the safety of cattle farms in the U.S.A. Mo was one of the heavy metals that caused the detrimental effects in the cattle on both my farm and the Boyce

farm.

I also know of a definitive diagnosis of Mo toxicity in beef cattle that were grazed on sludge fields by Dr. Larry Thompson of the Tifton, Georgia, Diagnostic Lab.

I recently obtained a University of Florida study that shows that 40CFR503 is not safe, and you can see that in the affidavit of Dr. David L. Lewis, Ph.D., as Exhibit A attached to my testimony.

Also, you can see the Project Summary titled *Sewage Sludge Viral and Pathogenic Agents in Soil-Plant-Animal Systems* as Exhibit B attached to my testimony.

One issue identified in this study is the increased uptake of most metals -- cadmium, lead, and zinc, for example -- in acidic or low pH soils which are common in the Southeastern United States. Yet, 40CFR503 does not have a requirement to restrict the land application of sludge to acidic soils.

Another example of why 40CFR503 is not safe is a recent case of approximately 5,000 acres of farmland in Alabama that has been contaminated with perfluorooctanoic acid, PFOA, and PFOSs and other perfluorochemicals, and you can find that in the Circuit Court of Franklin County, Alabama, case

Willard Stover v. Daikin America, Inc. Et Al., 33-CV-2009-900005.00. These two contaminates are not required to be tested under 40CFR503.

I'm sure most of you have heard or seen the movie *Erin Brockovich*. It concerns the contamination of groundwater with chromium VI, which caused many types of cancer in the residents of Hinkley, California.

We found in our case that Augusta's Wastewater Treatment Plant had issued permits for industry to discharge chrom VI into the sewers, but yet there is no requirement for sludge to be tested for chrom VI.

When in high concentrations in clay dust originating from fields treated with sludge, chrom VI could present a significant risk of lung cancer. Farm family members and employees could be exposed to chrom VI and many other industrial contaminates that can have detrimental health effects without any knowledge of exposure.

In summary, 40CFR503 does not have adequate provisions to prevent the contamination of productive farmlands. Current regulations allow industrial hazardous waste to become nonhazardous waste by changing pipelines.

The regulation 40CFR503 controlling the land application of sewage sludge does not require testing for all metals and organic compounds found in industrial waste.

As a result, 40CFR503 cannot prevent the contamination of farmland by the application of sewage sludge, and 40CFR503 fails to prevent the application of sewage sludge to acidic soils which results in greater plant uptake of toxic metals.

In addition to the basic issues with 40CFR503, according to the 2000 EPA Inspector General's report, the "EPA does not have an effective program for ensuring compliance with the land application requirements of Part 503. Accordingly, while EPA promotes land application, EPA cannot assure the public that current land application practices are protective of human health and the environment."

Thank you very much.

CHAIRMAN GEORGE: Has the gentleman concluded?

MR. McELMURRAY: Yes, sir.

CHAIRMAN GEORGE: You will stand for questioning?

MR. McELMURRAY: Yes, sir.

CHAIRMAN GEORGE: Thank you, sir.

The first individual, if you will yield one moment, is Representative Ross.

REPRESENTATIVE ROSS: Thank you, Mr. Chairman.

And Mr. McElmurray, thank you for coming all the way from Georgia.

I got a good sense of your testimony as it relates to Federal law and the restrictions that are applied or not applied at the Federal level.

Perhaps you could give me a little better understanding of what Georgia does or doesn't do in terms of requirements for testing of municipal waste, what kind of a regime they have for that currently, and whether or not, based on your experience, the city of Augusta actually properly followed that testing regime, if there is one.

MR. McELMURRAY: Well, first of all, most all the States now use the Federal regulations, although the States can write more stringent regulations if they desire to do so.

When they land applied the sludge on our property, they were using the Federal regulation 40CFR Part 257, which preceded 40CFR503.

The other part of your question, Augusta did

not follow any of the regulations required.

REPRESENTATIVE ROSS: I think that is pretty important.

Thank you very much.

CHAIRMAN GEORGE: Has the gentleman concluded?

REPRESENTATIVE ROSS: Yes.

CHAIRMAN GEORGE: Thank you.

The gentleman, Mr. Conklin.

REPRESENTATIVE CONKLIN: Thank you, Mr. Chairman.

I want to thank the gentleman for taking his time to come up and visit us today.

Just a couple of questions.

When you were talking about your cattle and the detriment that has happened to your property, at this point, has your property been able to have been reclaimed or are the effects from using this process still lingering?

MR. McELMURRAY: It is still lingering. Our property has been laying fallow for the last 11 years.

REPRESENTATIVE CONKLIN: My second question is, in Pennsylvania a lot of times they will try to use an incentive to get folks to place this on their

properties. They will give them tax breaks; they will give them money. Many of the distributors of these sludges will actually pay someone to allow them to spread it on their properties, and a lot of coal miners up our way that have had financial troubles have used this as a way to garner funds, by spreading this over their abandoned sites.

Can you address that, how Georgia was able to get folks such as yourself to buy into this program?

MR. McELMURRAY: In our particular case, the city of Augusta, they did not sell the material to us, they gave it to us and actually land applied it themselves for many years, and then later on they hired contractors to land apply it.

And I think, you know, all across the State of Georgia, it is given to the farmers.

REPRESENTATIVE CONKLIN: And just one last question.

I found it interesting that you touched on a little bit of how they are able to backdoor the safety aspect of this by putting it off to the side. But even further from your property and your neighbor's property that have used this, have you found or has there been found to be much

contamination that has come from the properties that have been used to adjacent properties that perhaps had no use for this but still have been contaminated by the use of it?

MR. McELMURRAY: I don't know of any case of any adjacent property being contaminated.

REPRESENTATIVE CONKLIN: Okay. Thank you.

CHAIRMAN GEORGE: Has the gentleman concluded?

REPRESENTATIVE CONKLIN: Yes. Thank you, Mr. Chairman.

CHAIRMAN GEORGE: I thank you.

And now I call on the gentleman from Armstrong, Representative Pyle.

REPRESENTATIVE PYLE: Thank you, Mr. Chairman.

Mr. McElmurray, thank you. It's a pleasure to hear somebody that speaks properly for a change.

MR. McELMURRAY: I just hope you all can understand me with my Southern slang.

REPRESENTATIVE PYLE: Oh, I hear you just fine, Brother. We're cool.

Here's my question for you: Was this sewage sludge that they put on your acreage -- and my family has roots in dairy farming also -- was that voluntary

or was that the State saying we need a place to put this and we're just going to give it to you? I mean, how did this happen, is what I'm asking.

How did it originate where Augusta was empowered to go put their sewage sludge on your land?

MR. McELMURRAY: Well, the EPA had indicated to the States at that time that, you know, that would be an alternative way of disposing of the material.

Prior to that, the city of Augusta was landfilling their sludge, and they had a centrifuge, so it was like a mud.

REPRESENTATIVE PYLE: A separator; yeah.

MR. McELMURRAY: Right, and they had problems with that equipment.

And about that same time -- this was in 1979 -- they decided, because the EPA had said, you know, it's an alternative method of disposal and passed it down to the State, and of course the Georgia Environmental Protection Division made Augusta aware of this, and so officials from the city of Augusta came out and approached my father about land applying the sludge.

We were the closest farm to the wastewater treatment plant. We were only about 7 or 8 miles

from the plant where our headquarters and our dairy operation was. That is how it came about, us starting to use that byproduct.

And when they approached my father about it, they told him it was human waste and they had a state-of-the-art wastewater treatment plant, and they had been using that material in China and Europe, you know, in China for thousands of years, you know, using human waste as fertilizer.

And, of course, being dairy farmers, putting, you know, cow manure on the fields, we didn't think anything of it, but it got us in a lot of trouble.

REPRESENTATIVE PYLE: I have a question for Mr. Chairman.

I must admit, I'm not terribly familiar with the topic, but what regulations does our DEP put in place concerning the application of this stuff?

I mean, is there a permit or something that somebody has to obtain to go put this on somebody's fields? I don't know.

Yes?

MS. FOX: You have to apply for a permit. You have to give your adjacent residents a 30-day notice that you are going to apply. They test for

nine heavy metals and two pathogens once a month, maybe, whether you need it or not, and that is basically it.

And you can spread sludge on a 25-degree slope. There are no wind regulations and there is no property setback regulation.

REPRESENTATIVE PYLE: And I guess in Burrell Township, Armstrong County, there is very little regulation on what falls off the truck and waste on the roads either.

MS. FOX: Well, yeah, that on top of everything else. But what the wind can carry is also quite nice, and when you have a flooding rain, I have numerous pictures of it---

REPRESENTATIVE PYLE: Right.

MS. FOX: ---going right from the sludge fields right into the top of Codorus Creek and all the other, you know, waters in the State of Pennsylvania going elsewhere.

REPRESENTATIVE PYLE: Well, thank you very much for answering my questions.

Safe journeys. Merry Christmas.

Thank you, Mr. Chairman.

MR. McELMURRAY: Thank you.

CHAIRMAN GEORGE: I thank the gentleman.

If you would, Madam, yield, please.

Would you identify yourself for the record, Madam?

MS. FOX: Susan Fox, Shrewsbury Township, Pennsylvania.

CHAIRMAN GEORGE: Thank you very much.

Now who was I to recognize? First I'm going to recognize the gentleman, Mr. Kessler. If you will, please.

REPRESENTATIVE KESSLER: Thank you, Mr. Chairman.

My understanding is that you have been spreading biosolids sludge, whatever you want to call it, for about 20 years. Is that correct?

MR. McELMURRAY: They actually land applied it on our property for 11 years.

REPRESENTATIVE KESSLER: 11 years. Okay.

The metal MO, molybdenum, however you pronounce that, that metal, I think, was found on your property and your soils. Is that correct?

MR. McELMURRAY: That is correct. It was found in very high levels on both farms, our farm and the Boyce farm.

REPRESENTATIVE KESSLER: Well, were those levels under the EPA standard?

MR. McELMURRAY: Well, I'll try to answer the question this way.

As I stated in my testimony, when the EPA came out with the 503 sludge regulation, they had a ceiling concentration limit, which is the level of molybdenum that can be in the sludge product itself.

They also had a lifetime loading limit, the maximum amount of molybdenum that could be applied over the lifetime of the property. And they removed that limit, and that is where the dangers come in. Although I disagree with the 75 ppms myself as well, but that is another issue.

But the main thing is, the lifetime loading limit is too high. It's dangerous for cattle, and the EPA is fully aware of it, but yet they have not to this day -- and this has been going on since '94, I think it is -- they have not added a lifetime loading limit back to the regulations.

REPRESENTATIVE KESSLER: And that was below the lifetime loading limit?

MR. McELMURRAY: I don't understand the question now.

REPRESENTATIVE KESSLER: The levels were below the lifetime limit?

MR. McELMURRAY: The ones they found on our farms?

REPRESENTATIVE KESSLER: Yes.

MR. McELMURRAY: No, they were not.

REPRESENTATIVE KESSLER: Okay. All right. Thank you.

CHAIRMAN GEORGE: I thank the gentleman.

The gentleman, Mr. Harhai.

REPRESENTATIVE HARHAI: Thank you, Mr. Chairman.

About 15 or 20 years ago, prior to being the mayor of my local hometown, there was a company that came in and they were going to use the sludge, it was pretreated, et cetera, et cetera.

And what the woman had mentioned in the back there about the open trucks transporting this, they were covered hoppers coming in and there was no chance. Now, it was dried and chemically treated and then dispensed upon properties, et cetera.

They never did it. They voted it out and didn't do it.

There was a commercial product called Milorganite that was made from that. I'm going to yield a little bit. Have you heard of that one?

MS. FOX: Yes.

REPRESENTATIVE HARHAI: Now, it never happened. For obvious reasons, it never happened.

So why all of a sudden -- and that was about '94 or '95 at least that they did that, or maybe a little bit earlier -- why would they now spread something that is not treated and put that out with all of the metals, et cetera -- molybdenum, as you had mentioned, et cetera?

I mean, I'm wondering why we didn't do it 20 years ago but yet we are going to do it now? And it is not treated, as you have explained. And I apologize for being late.

MR. McELMURRAY: Well, you know, in some areas they were obviously, you know, land spreading that. I guess in that particular area they just decided not to do it.

REPRESENTATIVE HARHAI: Well, there was going to be a processing plant where there was going to be no smell, no open hopper bringing -- in other words, it was actually going to be trucked in or railed in. And then they were going to make a commercial product, Milorganite, or take regular spread, if you will -- I think that is how they referred to it -- and they would take that out, not bagged, as a commercial product of Milorganite.

And that's the only product that comes to mind at this time. But they would take it, the trucks would bring it in, a separate truck would take it back out -- post-treated -- and then it would be spread out, and they voted it out. They were going to bring it into the community to process and make the plant there, and then they didn't do it, and for obvious reasons.

And then now, as I came in -- and I do again apologize for being late -- they are going to put this stuff out there not treated and you are going to be susceptible to a bad EPA practice possibly?

MR. McELMURRAY: Well, it is treated, supposedly.

REPRESENTATIVE HARHAI: I mean, to what degree? It doesn't sound like treated---

MR. McELMURRAY: Well, that's my question. You know, how much do they need to treat it?

In my opinion, from my experience, they can't treat it enough. They can't remove the heavy metals.

And, you know, in our case, that is where the problem is, all these heavy metals and the unregulated heavy metals. 503 only regulates nine heavy metals.

We found several on our property that were outside of that nine that were above Georgia cleanup standards. So it has put me and my family in a precarious position, because we've got conflicting laws. We got Georgia cleanup standards that are below, for the nine metals, that are below the 503 standards and also have cleanup standards for other metals outside of what 503 regulates.

So the farmer gets himself caught in a trap, and that's one thing that I've tried to stress everywhere I go and try to talk to farmers and tell them about it. You can get yourself caught in a legal trap that you cannot get out of. You have no recourse whatsoever.

I don't know how the laws are here in the State of Pennsylvania, but in Georgia, city and county governments have sovereign immunity from torts. So if a city land applies a municipal sludge on the property, they trespass on the farmer's property or it's a bad sludge and you got products liability, you have no recourse because of sovereign immunity. That's the way it is in the State of Georgia.

REPRESENTATIVE HARHAI: Are you responsible for that cleanup?

MR. McELMURRAY: Well, I haven't gotten a direct answer on that yet. I'm still working on that after 11 years, from both EPA and the Georgia Environmental Protection Division.

REPRESENTATIVE HARHAI: You have to take what you get and you have no recourse at this point?

MR. McELMURRAY: So far, I have no recourse.

REPRESENTATIVE HARHAI: Thank you.

CHAIRMAN GEORGE: I thank both gentlemen.

Are there any other questions for the gentleman?

If not, we thank you for making such a long trip and honoring us with your presence. I thank you very much.

MR. McELMURRAY: Yes, sir. Glad to be here. Thank you very much.

CHAIRMAN GEORGE: And now we call on the gentleman, Dr. Murray McBride, Director, Cornell Waste Management Institute, Cornell University.

The gentleman is going to offer a slide. If you can, get yourselves in position to view it.

You may proceed, Doctor, when you're ready.

DR. McBRIDE: Thank you, Chairman.

I want to thank the Committee Chairman and Representative Kessler for inviting me here to

present testimony regarding the use of sewage sludge, or biosolids, as a soil amendment.

This is based on knowledge that I have gained over several decades that I have been involved in research and in helping to develop recommendations based on scientific information.

I have a statement here, but Mr. Kessler thought perhaps it would be more effective to present some slides. So I can't see them because they are behind me--- Okay. That's the title slide: "Concerns with Application of Sewage Sludges on Agricultural Land."

The next slide, please.

REPRESENTATIVE HARHAI: Do you want to sit on this side and turn the thing over? Why don't you come over here?

DR. McBRIDE: Oh, okay. That helps.

So just quickly a review on sewage sludge generation. Many of you may be familiar with this.

Keep in mind that sewage sludges are produced from effluence from homes but also from hospitals, from research laboratories. Industries are allowed to dump materials into the waste stream as well as businesses and even street runoff.

There has been pretreatment of some of the industrial discharges to wastewater treatment plants, and this has improved sludge quality in the restrictive way; that is, in terms of certain metals, cadmium being the obvious one.

Wastewater treatment plants are designed to clean water, not to produce a clean sludge. The contaminates, in fact, in these wastes are preferentially deposited in sewage sludges. For example, at least 90 percent of the dioxins and 95 percent or more of the metals, heavy metals, end up in the solids of the sludge.

Sewage sludges and sludge products are all very different, and making generalizations about sludges based on the behavior of one or two is a very faulty approach. The stabilization processes used in sludges are different, and this affects their behavior in soil.

Sewage sludges' quality varies tremendously over time and place. If you look at a given treatment plant, you can see spikes in certain contaminates from month to month or week to week. If you look at one treatment plant versus another, you will see huge differences.

The next slide, please.

So why are we land applying sludges?

The obvious reasons -- well, the obvious reason, I guess, is the bottom one. It's a low-cost disposal option relative to the alternatives, in most cases. There is an income or offset cost to the farmer. Depending on which farmers and which regions, some are actually being paid to take this material.

And there are potentially soil benefits; there is no question. This material does have a relatively high nitrogen and phosphorous content.

At the present time, estimates indicate maybe 50 to 60 percent of sludges produced in the U.S. are land applied.

What are the concerns then? Next slide, please.

The concerns, of course, I'll mention one which sometimes isn't brought up, but the nutrient excess on land. And I raise that one because in New York State, it tends to be, interestingly enough, the dairy farmers who are using this to the greatest degree. I don't know if that is true in Pennsylvania.

Dairy farms, almost to a farm, have an excess of nitrogen and phosphorous already on farm

from manure. So in the nutrient planning that they are required to do, the import of more nitrogen and phosphorous doesn't make much sense.

But the other concerns, of course, that get a lot of attention are the contaminants, and by contaminants I mean pathogenic disease organisms, metals -- heavy metals -- and synthetic chemicals, of which there are thousands at significant concentrations.

These have potential impacts, many of which haven't been studied on humans, on crops, on soil organisms, on livestock, and on wildlife. And the EPA has never done a significant ecological assessment of the impacts of putting these on the landscape, and there is the issue of groundwater contamination.

And now we know a little more about the odor and bioaerosol problem, the fact that people living adjacent to application sites are getting sick. And we have on our Website cases listed there of neighbors of application sites. These people are getting sick with rather similar symptoms.

These offsite impacts result not only from odor chemicals -- and after all, these odors are chemicals, some of which are actually very irritating

chemicals -- but also these endotoxins, which are basically pieces of bacterial cell walls, which we tend to have rather severe allergic reactions to. So there are some health problems offsite.

And then finally, again, this great variability from treatment plant to treatment plant and time to time makes generalizations about sludge safety, I would say, virtually impossible.

The next slide, please.

Now, the 503 rule, as Mr. McElmurray referred to, the 503 rule came in in 1993, and I should point out that the Pennsylvania DEP pretty much follows these rules intact. In fact, they take the metal standards without change. So Pennsylvania rules are no more restrictive than the EPA on the nine metals.

But to develop that EPA rule, you have to go into the nuts and bolts of how this was done, which we did for a number of these pathways of exposure, and we found them lacking, at least in the parts we looked at.

What EPA did, what their scientists did, was identify the chemicals and pathogens that would be of concern. They identified the pathways of exposure to humans. They quantified that exposure or estimated

that exposure to humans, the amount and the fate and transport. They calculated impacts to people, to agriculture, and it says to the environment, but in fact they did no ecological impact statements or risk assessments.

And then they made some choices about acceptable risk, and we could debate about whether their criterion for acceptable risk would be acceptable to the public.

The point is that that 503 rule is now badly out of date. It was promulgated in '93. It was based mostly on research that had been done through the seventies and eighties, much of which I was involved with -- well, some of which I was involved with.

The emphasis was on a few metals at that time -- that is where most of the research was done -- and a few pathogens. Today we have a completely different class of synthetic organic chemicals that are present in sludges. We know this. EPA's rule has not changed.

The next slide, please.

So what are the chemicals in sludge? Well, everything that gets dumped down the sewer; everything that gets dumped down the sink at home or

flushed down the toilet.

There are many, many thousands of chemicals in use, and many of these were introduced since the 503 rule. So unless the EPA is clairvoyant, I don't know how they would know the toxicity of these recently introduced chemicals.

Few of these chemicals of these thousands of chemicals, for obvious reasons, have been studied for toxicity. At this point, not a single synthetic chemical is regulated by the EPA for agricultural land application, and that includes dioxins.

All of these chemicals at the time when the '93 rule came out were eliminated from consideration for one of several reasons. Either they were no longer being produced, such as PCBs. So my understanding is we don't manufacture PCBs, and yet, interestingly, PCBs show up.

They showed up at the Milwaukee Treatment Plant about a year and a half or 2 years ago and contaminated a lot of that Milorganite product. Actually, it was claimed this was not sold as Milorganite. This was product that went out onto recreational areas, parks within the city of Milwaukee. They then had to do remediation -- go out and scrape that material back off of those playing

areas.

Where those PCBs came from isn't known, but the point is that these chemicals, even though they aren't being manufactured in theory, are still out there and perhaps in storage.

Other reasons for eliminating chemicals from consideration is if you don't have any data, so out of sight, out of mind. If you have no data on the toxicity or the behavior of a chemical, you can't do a risk assessment on it, so you basically ignore it, and that was the approach. Otherwise, this was an intractable problem.

Or if the chemical was not detected in more than 10 percent of sludges in the National Sludge Survey that was done back at that time. I think that was done in the late 1980s. So in other words, if less than 10 percent of sludges analyzed did not show a particular chemical, it was decided it did not occur in enough frequency to be a problem.

This is kind of an averaging concept. The problem with that is, for farmers, farmers don't get an average sludge. Farmers get a sludge from a particular treatment plant or one or two or three treatment plants. So what matters to the farmer is what is in those treatment plants, not the average.

And then finally, they did not consider chemicals that had a low hazard index or cancer risk. Well, that is a perfectly reasonable criterion to eliminate a chemical from consideration, but keep in mind that cancer is not the only disease we need to be concerned about, and now we are talking about endocrine-disrupting chemicals.

So many of the chemicals in present-day sludges have endocrine-disrupting properties, and they are more subtle in their effect on humans and animals.

So the most recent data we have on what is in sludges now comes from the 2008-2009 EPA survey. The next slide, please. All right.

And in that one, the EPA analyzed sewage sludges from 74 POTWs. Keep in mind that 74 POTWs is 74 out of 3,337 treatment plants across the United States. So it's a very small sampling. It was a major undertaking and yet a very small sampling.

They found 145 different chemical concentrations in sludges, and these included metals, brominated fire retardants, pharmaceuticals, steroids, and hormones.

The next slide, please.

I'm not going to read through that one, but that is taken directly from the EPA page on that report, which basically lists the pharmaceuticals that were found, the 27 metals that were found. It says there that 27 metals were found in virtually every sample, with one metal, antimony, found in no less than 72 samples out of the 74.

Antimony, as Mr. McElmurray pointed out, is not a regulated heavy metal, but it is toxic, similar in behavior to arsenic.

The next slide, please.

I have taken the data from that survey and made a little table, and I just sort of randomly, not randomly exactly, but picked out a few of the contaminates of some concern.

The first one I show there is benzpyrene, which is a PAH-suspected carcinogen, and I want you to see the range there in that table. You see that carcinogen is from coal tar, from soot, and from char, which you will find in urban areas, street runoff and so on, from diesel exhaust, diesel smoke.

The lowest value on the benzpyrene was 28 parts per billion, and the highest was 2,000 parts per billion. Obviously then -- sorry, that wasn't the highest. I can't read the highest, but it is

somewhere over 2,000. That shows you the range. So talking about a typical level of PAH or of any chemical is fraught with difficulty.

The next one I show is Bis(2-ethylhexyl) phthalate. Phthalate is a plasticizer with known endocrine-disrupting properties. It's present in plastics.

This material is in sludges at high levels, anywhere from, the median value is 1,100 parts per billion and the highest value was 17,000 parts per billion. That is 17 ppm, which is quite significant. An endocrine-disrupting chemical -- not, of course, not regulated.

Now the fire retardants. The PDDE listed there is a fire retardant. The fire retardants were found in every single sludge analyzed, and this is one of about several dozen fire retardants present in these sludges.

These chemicals behave like PCBs. They bioaccumulate into animals. They bioconcentrate in fat tissue. They are now found in humans and found in mothers' milk.

And in Europe, especially in Sweden where they have noticed this trend of increasing fire retardants in mothers' milk, they have banned a

number of these chemicals because of the fear of health effects.

And then Cipro shown there is a broad-spectrum antibiotic. It is found in sludges at relatively high levels, but again, with a very wide range.

And Triclocarban, which is used in antibacterial soaps, antimicrobial soaps. So those hand soaps you use, if you look at the label you will see Triclocarban or Triclosan, and this is going down the drain in hundreds of millions of homes around the country and concentrating in sludge and ending up on farmland. This chemical has now been shown to bioconcentrate into earthworms.

Now, the next slide, please.

So why do we care about these organic chemicals? Because some of them are persistent organic chemicals. We call them POPs, persistent organic pollutants. And when they're persistent like that, like Triclocarban, like the fire retardants, they bioaccumulate from the soil to livestock to humans.

They are persistent in the soil. We estimate half lives of these chemicals in soils on the order of many decades and perhaps centuries.

So it's not a reversible process. We can't say, oh, tomorrow let's stop doing this and everything will be fine. We are gradually building up soil levels of these chemicals.

These have human, we think they have human toxic effects. Those are still being studied. I mean, very, very, I should say, intensively. And some are carcinogens; some are neurotoxic; some are endocrine disrupting.

The health effects, the severity of the health effects of these are not known. And to me, that's the scary part; we simply don't know.

Now, as I said, there are new POPs now showing up in sludges that have not been regulated, and I don't anticipate to see new EPA rules anytime soon on these.

The next slide, please.

That's a bar chart showing, the black bar is indicating the levels of dioxins in soil where sludge has been applied. The lighter bar beside each of the black bars is the level of dioxin before the sludge was applied.

That is a summary of studies done by Rideout et al., and they published this work showing that in every single case where somebody measured dioxin in

soil before and after sludge application, the dioxin level rose. In some cases, it went up markedly, and yet, EPA does not regulate dioxin.

The next slide, please.

So to summarize on the organics, and by "organics" I mean the synthetic organic chemicals, most synthetics degrade in soil, but you will notice that a lot of the synthetic chemicals don't degrade in the wastewater treatment plant. This was assumed years ago, that most of these chemicals broke down in the anaerobic digesters. Many of them do not, and certainly the persistent ones don't.

There is a low risk of transfer of most of these into crops by plant uptake. So that's the good news.

The bad news is, if you have grazing animals or even if you are cutting hay, you end up with some soil, some dirt, in the hay. Cattle or sheep will get some of the soil ingested into their bodies, and then these organic chemicals can concentrate into their body tissues.

So I would say grazing animals on surface-applied sludges has to be one of the more risky approaches to sludge application, and yet that is where I have seen it as the most common practice

in New York State.

How am I doing for time? I can quickly go through. Okay; next slide.

What about the metals? I can talk briefly about the metals.

Mr. McElmurray pointed out there are only nine metals regulated, and the agency such as the EPA had to make decisions about which metals. After all, there are, I don't know, 30 or 40 metals on the periodic table.

So by my estimate, there could be at least 10 to 15 metals that could be harmful. Mr. McElmurray mentioned thallium; he mentioned antimony. There is also tin. We are finding high tin in some sludges. We don't know what that's all about. We are finding high silver in some sludges.

The regulated metals, by and large, it's true, have come down since the 1970s, back in the bad old days when we had sludges in Upstate New York that had several hundred parts per million cadmium that were being land applied. That generally doesn't happen anymore. But we have these other ones that are under the radar screen.

Which metals should we regulate? Are they harmful, and to what or whom? Which pathway of

exposure should we be worried about? What assumptions do we make about acceptable thresholds?

As you may know, EPA set a threshold of 50-percent yield reduction for the metals zinc and copper. In other words, they assumed that if zinc and copper in the soil didn't cause more than a 50-percent reduction in yield, that was acceptable, an acceptable limit.

I thought, to whom? And I don't know any farmers who would accept even a 5-percent yield reduction if it could be measured.

So these decisions about risk, unfortunately, for these various metals are complicated. And again, I would be surprised, I would love to see the whole situation revisited by EPA. I don't know that they have the resources to do this.

Next slide, please.

So the point is, today there are sewage sludges which commonly contain high levels of some toxic metals for which there are no regulations. This was demonstrated in the 2009 targeted survey.

The next slide, please.

You will see on that slide I have put up there molybdenum, silver, lead, and zinc. The last

two are regulated metals, and we see that the median value for lead is 46 parts per million, which is a lot lower than it was 20 years ago, and zinc is at 770, which probably isn't much lower than it was 20 years ago. A lot of that zinc is coming from plumbing.

Silver, though, is showing up at high levels in some sludges, as is molybdenum. Molybdenum is one I have worked on because of its effects on animal health, readily taken up by crops.

The next slide, please.

This is a set of data from a survey done in Canada showing the variability you get in 26 different treatment plants analyzed over 1 year, 1 month apart, each month. And what that is showing is the tin levels in sludges from those different treatment plants. And that graph is showing at times thousands, not at times, consistently, thousands of parts per million tin in some treatment plants and very low levels at most treatment plants.

So back to the issue of uncertainty and which plants are going to be high and which are going to be low. The farmers are going to have no idea, because the tin will not be analyzed in the material.

The next slide, please.

So the point is, the variability makes this material, despite the fact that I have encountered people who claim that, well, animal manures are as bad or worse, that is not true. Animal manures are far more consistent, have far fewer contaminants in them.

The only contaminates we have encountered are copper on some dairy farms, and we know exactly where that is coming from. And beyond that, some poultry farmers are using arsenic for reasons that I think are not defensible, but they are.

But these are a few metals and the sources are well known, and these practices can be changed quickly.

The next point; the next slide. I'm going to skip that one.

And then I'll just say, we have worked on how long these metals persist in soils, and the point is, it's a very long time.

The metals don't leach much; they leach a little bit. And we have gone back to sites where sludges were applied in the late 1970s and we still see the impacts of these metals on forage quality some 20, 25 years later.

So the last slide.

Why sludge on dairy farms, and dairy farms especially? I think I put it at the top of my list as the most potentially dangerous.

There may be some practices such as the growing of crops for fiber or for energy where you might use, in a very well regulated manner, you might use land, perhaps marginal land, to grow fiber or energy crops.

But on food crops, I have got a big problem with that. First of all, on dairy farms, sludge application can lead to an imbalance of trace elements and an excess of toxic elements in the forage, causing poor thrift or even outright disease.

The application is commonly done, in my part of the world, without incorporation, so there is no dilution factor on the contaminates.

There is a potential for toxic synthetic chemicals such as the brominated fire retardants getting into milk, getting into meat, and this is not being assessed at all. I don't know of a single research study done in the United States or Canada that addresses this question of whether these chemicals are going into milk.

And third, lastly, import of nitrogen and phosphorous to dairy farms seems to me rather

ridiculous when most farms that we do the nutrient balance on have already an excess.

The last slide. Sorry; one more slide.

The "case for caution." This was a term that my predecessor, Ellen Harrison, came up with. Why are we cautious about this?

Because, one, our ability to confidently predict risk from land application is very limited based on the evidence we have.

Two, the liability rests largely with the farmer.

Three, the sludge composition is highly variable and unpredictable in both time and place.

Four, if there is a problem, if a farmer has a problem, and I have encountered a number of farmers with problems, it's hard for them to prove it: Oh, was it the sludge?

And finally, the enforcement and monitoring are completely inadequate in our State. I don't know what the situation is here, but we do not have enough staff at our DEC to actually come out to the farms where there are reported problems.

Thank you for your attention.

CHAIRMAN GEORGE: Has the gentleman concluded?

DR. McBRIDE: Yes.

CHAIRMAN GEORGE: Will the gentleman stand for a couple of questions? We are running a little late, but I'm sure there are some.

The first question will be from Representative Santarsiero.

REPRESENTATIVE SANTARSIERO: Thank you, Mr. Chairman.

Thank you, Professor McBride, for your testimony this morning. I just have a few questions.

First of all, in your opinion, where are the majority of these hazardous substances coming from in the sewage sludge? Are they industrial hazardous substances or are they associated with household waste?

DR. McBRIDE: Well, it's a mix of both.

REPRESENTATIVE SANTARSIERO: Okay.

DR. McBRIDE: So I didn't even stress the pharmaceuticals. The EPA survey showed a tremendous array of pharmaceutical chemicals, and those are largely coming from homes. I mean, they have to be.

REPRESENTATIVE SANTARSIERO: Right.

DR. McBRIDE: Drugs, various drugs dumped down the drain, but also shampoos, whatever --

perfumes containing musks.

These chemicals we think of as benign; we bathe ourselves in them, but in fact they are very toxic in water to various aquatic organisms. So a mix of both.

We're still not clear where the brominated fire retardants are coming from, but they are coming out of plastics. And how they get out of plastics and into that sludge, into the water and then into the sludge, isn't clear because they're not very water soluble.

Some of the chemicals like silver or antimony, I'm guessing there are some industrial sources.

REPRESENTATIVE SANTARSIERO: And, Mr. Chairman, if I may follow up.

CHAIRMAN GEORGE: Has the gentleman concluded?

REPRESENTATIVE SANTARSIERO: May I follow up with one other question, please?

CHAIRMAN GEORGE: Yes indeed.

REPRESENTATIVE SANTARSIERO: Thank you.

You talked a bit about liability. Are you aware of any instances where either a municipality or a private entity that was responsible for spreading

the sludge on, say, a farm has been sued either under CERCLA or a State cognate law for having caused a discharge of a hazardous substance?

DR. McBRIDE: I'm not an expert in the law. I know of cases where lawsuits have been brought.

I know of cases where bans have been put on municipalities, in which case they are then sued. I'm trying to think about the other way.

Yes, I know of cases where lawsuits were attempted.

REPRESENTATIVE SANTARSIERO: Because I think there would be potential liability, both as a generator and a transporter of hazardous substances under CERCLA, if this were the case.

And most State statutes would not preclude those lawsuits from going forward, and there would be potential third-party suits as well. If, for example, either the State or the EPA were to bring suit, then other parties would be able to file suit to other responsible parties as well.

I was just curious as to whether you are aware of that.

DR. McBRIDE: I can think of cases where individual farmers attempted to bring a suit.

REPRESENTATIVE SANTARSIERO: Right.

DR. McBRIDE: Maybe Andy can address that better.

MR. McELMURRAY: As far as CERCLA is concerned, which is the Superfund law that you are referring to---

REPRESENTATIVE SANTARSIERO: Right.

MR. McELMURRAY: ---sewage sludge is exempt. They have what they call a normal-application-of-fertilizer exemption.

REPRESENTATIVE SANTARSIERO: Right.

MR. McELMURRAY: And this is another scheme of EPA's to remove the liability from potential responsible parties that come under the Superfund law. So there is no avenue to sue under Superfund if your land is contaminated by sewage sludge.

REPRESENTATIVE SANTARSIERO: And do we know, at least in Pennsylvania, I don't know if anyone knows in Pennsylvania whether there's a similar exemption under the Pennsylvania cognate to CERCLA. Does anyone know?

Do we have any representative of the DEP here today?

CHAIRMAN GEORGE: Pardon me. Is your microphone on, please?

REPRESENTATIVE SANTARSIERO: Yes, it is.

My question, Mr. Chairman, is, do we know under Pennsylvania law whether, under the Pennsylvania cognate to CERCLA, whether there is a similar exemption to sewer sludge?

CHAIRMAN GEORGE: I'm not aware, and we will get that answer for you after we have concluded this meeting.

REPRESENTATIVE SANTARSIERO: Thank you.

I have no further questions.

CHAIRMAN GEORGE: Has the gentleman concluded?

REPRESENTATIVE SANTARSIERO: Yes. Thank you, Mr. Chairman.

CHAIRMAN GEORGE: Now, we are running out of time, so now I will recognize the gentleman, Mr. Seip.

REPRESENTATIVE SEIP: Thank you, Mr. Chairman. I'll be brief.

Thank you for your testimony today, Dr. McBride.

There's a treatment authority in my legislative district that consulted a firm from Australia called Vermitech. I don't know if you're familiar with them at all.

They were seeking an alternative to depositing all of their biosolids into a landfill, which they tell me was about $70 a ton or so.

I know there's a facility up and running in Granville, not to be confused with Grantville -- Granville -- where they have five municipalities using this technology, I believe. They are using a Pennsylvania preferred product from the Chairman's district, the red worms, to process this product.

I just have one quick question for you. Is this a good alternative to landfilling? And I certainly am less versed in the science of all this than you are, and I have some concerns about just packing this product into a landfill, the biosolids.

I just want to know if you could touch on if you are concerned about landfilling the biosolids.

DR. McBRIDE: Well, I'm concerned about landfilling.

We have Seneca Meadows up the road from us, which is becoming a huge landfill for us, maybe even for Pennsylvania -- I don't know. We have trucks coming up from Binghamton.

But as far as vermiculture, I mean, there are people, colleagues of mine at Cornell, working on it, but not on sludge. The problem there is, the

worms aren't going to change the fact that you've got these persistent organic pollutants. They are probably going to bioaccumulate them, but they are not going to degrade them.

The process of vermiculture won't degrade those chemicals, won't degrade the metals. That whole process, though, does do some, I think, further decomposition of the more less-resistant chemicals.

There would be some improvement in the material. That still wouldn't be a material that I would be too comfortable with applying for food production or something like that -- on a garden, for example.

But vermiculture is becoming a big deal, you know, for a way of processing paper waste mixed with other clean organic materials to produce a viable product, a fairly high-value product, for nurseries, for gardeners.

REPRESENTATIVE SEIP: Right.

We are all interested in trying to find a solution or somewhere or something positive to do with this material, because we're certainly not going to stop making it, are we?

DR. McBRIDE: Right.

REPRESENTATIVE SEIP: Thank you for your testimony today, Dr. McBride.

Thank you, Mr. Chairman.

CHAIRMAN GEORGE: I thank the gentleman.

I'm going to allow two more questions.

First it's going to be the gentleman, Mr. Conklin, and then the gentleman, Mr. Ross.

REPRESENTATIVE CONKLIN: Because of my fear of the Chairman, I'm going to make these very, very quick.

Just very quickly, earlier in your testimony you were talking about nitrate levels being within the waste of the biosolids that are being put out.

In Pennsylvania, we have what is called the Chesapeake Bay Project, which is under Federal regulation because of the nitrates that are being put off, and it is putting a huge burden on local municipalities, developers, and farmers.

How much nitrate do you think is added to the soil because of the sludge that is being used on it, and how much of that do you believe may be running off into the stream and even causing more of a problem?

DR. McBRIDE: The sludge material, if it is anaerobically digested sludge, and most treatment

plants are anaerobic digestion, the product, as it comes out of the plant, has actually very little nitrate in it but it has a lot of nitrogen. So that is organic nitrogen and some ammonium.

That all, well, ultimately, assuming it is working properly in the soil, ends up as available nitrate for the plants.

Now, how much runoff there is depends on all of the site conditions. Of course, it depends on how much rainfall you get; it depends on the slope and so on. Farmers have been facing that problem forever with their manure application.

So I can't answer the question as to how much.

REPRESENTATIVE CONKLIN: All right.

DR. McBRIDE: It all potentially becomes nitrate, although the thing about organic material, I mean, the advantage of organic material, whether it's in sludge or animal manure, it's not all released at once as nitrate, and nitrate is the movable form.

So in the first year it is estimated maybe 25 to 30 percent of the total nitrogen in the material becomes nitrate. If your crop can use all that, you're in good shape. I mean, you're not losing much.

So if management is done well, then you shouldn't have a huge loss of nitrogen.

REPRESENTATIVE CONKLIN: Thank you.

I have a couple of others, but for fear of the Chairman, I'll pass for now. Thank you.

REPRESENTATIVE ROSS: Thank you, Mr. Chairman. I'll be brief.

The question I have is that if a significant heat source was applied to the sludge with the constituents that you have been finding in it, and in the course of that heating, either to dry it or incinerate it, the gases were not completely captured coming off of that operation and fully contained, would you have concerns about any of the constituents that you found volatilizing and possibly getting into the air?

DR. McBRIDE: I would, and depending on the temperature, the highest temperature you reach, it is my understanding you have to get to perhaps 700 degrees centigrade or higher to be assured that you're not creating dioxins and releasing some of those.

Mercury can be emitted, again, depending on temperature. If it is done properly, if incineration or high temperature pyrolysis is done properly and

there is capture of, say, the mercury, then there should be relatively little problem emissions.

REPRESENTATIVE ROSS: Thank you.

That concludes my question, Mr. Chairman.

CHAIRMAN GEORGE: If that will conclude the inquiries, we want to thank you very much for your testimony and for providing us with this information.

DR. McBRIDE: You're welcome.

CHAIRMAN GEORGE: Now, with no further delay, we'll call the next witness, which will be the gentleman, Paul Herb, Wastewater Treatment Plant Superintendent of Exeter Township, Berks County.

In the meantime, I would like to thank the lady, Representative McIlvaine Smith, for being with us.

And my Co-Chairman wants to introduce a couple of the Legislators that are here.

REPRESENTATIVE HUTCHINSON: Yes. Thank you, Mr. Chairman.

I also wanted to recognize several members for the record that have joined us today, and that would be Representative Dave Millard, Representative Russ Fairchild, Representative Merle Phillips, and Representative Jerry Knowles, all who have an interest in this hearing, and we are delighted that

they have joined us today. Thank you.

CHAIRMAN GEORGE: You may proceed, Mr. Herb.

MR. HERB: Thank you.

Good morning. My name is Paul Herb, and I am Exeter Township's Wastewater Treatment Plant Superintendent.

With me are some of the members of the Project Team. We have been working for 2 years in developing a Regional Sludge Drying Facility to convert wet and dry cake sludge into biosolids energy at our plant. They are Exeter Board Vice Chairwoman Michele Kircher; Steve Riley and Bob Weir, Project Engineers from Entech Engineering; and Project Team members David Miller and Doris Heckman, who are township employees.

We are here at the request of Representative David Kessler to share our project with this committee.

Before I begin, I want to take a moment to thank Representative Kessler and the members of this committee on behalf of Exeter Township, its Board of Supervisors, and the Project Team for the opportunity to share information on our Regional Sludge Drying Facility Project. We are excited about it and are happy to tell our story.

Our project began because Exeter Township was looking for a solution to the consistently rising landfill disposal costs.

In 2005, the township experienced a 41-percent increase in its sludge disposal fees. The cost went from $58 per wet ton to $82 per wet ton. In 2009, Exeter saw another 18-percent increase in its sludge disposal fees. Under our current contract, we are paying over $96 per wet ton.

In 2008, Exeter paid $650,000 in landfill disposal fees for our sludge. In 2009, we are paying well over $600,000 in landfill fees.

We have a concern about the inevitable reduction of the numbers of landfills available for sludge disposal as their capacity is reached. The result for municipalities like Exeter is to either pay higher landfill costs in this supply/demand cost-accelerated environment or to seek an alternative.

Our response to the situation was to begin investigating ways to reduce the amount of sludge being disposed of, thereby reducing the disposal costs.

Economic value is a consideration of the project. A feasibility analysis proved it made

economic sense for Exeter to process its sludge alone. However, with economies of scale, it becomes more cost attractive as more municipalities participate, allowing Exeter to share the savings with others.

Exeter's goal is to continue with the clients we already have and to seek more clients to process their waste at our plant to become a larger regional service provider.

The goal is to develop the operation to a size where the cost to process liquid sludge and liquid cake at Exeter is more attractive to other municipalities than alternative disposal methods.

Exeter decided to design and install a $7 million biosolids dryer facility that will be completed by the end of 2010. To help us financially, in June of 2008 the Department of Environmental Protection awarded Exeter a $1 million Pennsylvania Energy Harvest Grant towards the purchase of the biosolids dryer.

We were very encouraged by the DEP award, because it was the maximum amount of money that could be awarded to one grantee in that round.

Also, we have been advised by the Department of Community and Economic Development that while our

application for the H2O Grant was not awarded in this round of funding, it will be considered again in the next round of funding in November of 2010, closer to our project completion date.

It would be a lot easier on our residents and businesses to have this multi-municipal, multi-county project further subsidized given its ultimate benefit to Exeter and other municipalities in the region.

Processing sludge through a sludge dryer will reduce operating costs for all and will provide an opportunity to convert a waste product into energy.

The Exeter facility will house a 72-wet-ton-per-day sludge dryer, which is essentially a big oven using heat to evaporate water from sludge that will have first passed through a centrifuge.

To compare the difference this process will make, let us look at the percentages of water removed from sludge by each process.

Currently, the sludge we dispose of is 18 percent solids and 82 percent water. By using the dryer, the sludge becomes 90 percent solids and 10 percent water, reducing the amount of sludge generated for disposal by four-fifths. That means

only one-fifth of the amount of dewatered sludge has to be disposed of at one-fifth of the disposal cost.

Using 2008 costs, we would have paid one-fifth of $650,000, or $130,000, for disposal. That is quite a savings, and you can see how we would get a return on our investment.

The environmental benefits are significant as well. Biosolids drying causes destruction of bacteria and reduction in odors and produces a Class A pathogen-free biosolids suitable for many applications.

Exeter sees this as an opportunity to dispose of dried biosolids by using the end product as an alternative energy source; that is, as a fuel source for an industrial process with a large burner that could use biosolids as a fuel supplement.

Some examples are coal-fired power plants, large steam boilers, and cement kilns. This would allow for the partial avoidance of other energy sources such as coal.

As an example, if biosolids were used to heat cement kilns, the ash residue would become a part of the cement, thereby totally eliminating what was once a waste product.

There are recycling advantages. There is the potential to use methane gas, currently burned off in a flare, as an alternative fuel source to fire the sludge dryer.

The 300-gallons-of-water-a-minute needed to operate and cool the systems in the sludge-drying process will be provided by recycling our plant's treated wastewater.

It is important to note that our plant's location is an ideal site for our Regional Biosolids Dryer Facility. It is centrally located, already permitted, has ample source of water to cool the dryer, and, as we said, space for the equipment on the 40-acre site.

We are experienced. Exeter Wastewater Treatment Plant personnel are experienced at and have been recognized by the Environmental Protection Agency, having received their award for excellence in operations and maintenance.

We operate a Regional Hauled Waste Program. Currently, Exeter provides disposal of liquid for a total of 54 municipalities from Philadelphia, Allentown, Lancaster, Lebanon, and the Harrisburg regions.

In addition, the plant processes industrial

waste, leachate from seven different landfills, and septage from homes and businesses. This experience of operating as a regional service provider has prepared the wastewater treatment staff to do the same with the sludge dryer.

Interest in an alternative means of sludge disposal was evident by the survey that Exeter conducted. In 2005, over 40 percent of the participating municipalities in the survey indicated they had an interest in an alternative way to dispose of their sludge.

Several were already committed to contracts with landfills at a fixed price. They said they would consider joining us when these contracts expired.

Now, we know other municipalities' considerations are economic, just as Exeter's was. In light of that knowledge, our Project Team has met with Representative David Kessler to seek his advice on how we can provide an incentive for municipalities to use our plant for processing sludge.

He has been very gracious, enough to give us the time to discuss our project, and for that we are grateful. The Project Team continues to encourage more municipalities to bring their sludge to us and

is exploring financial incentives to accomplish that goal.

We think it is important to note that in addition to Representative Kessler's and the Department of Environmental Protection's support, Exeter's Biosolids Dryer Project has been endorsed by State Senator Michael O'Pake and the Berks County Commissioners.

In closing, I again thank this committee for taking the time to hear about our project. I am confident that the effort Exeter has spent will not only benefit its residents and businesses but will benefit other Pennsylvanians once they hear about the economic and environmental benefits of using biosolids fuel, especially if additional incentives can be added.

CHAIRMAN GEORGE: Has the gentleman concluded?

MR. HERB: Yes.

CHAIRMAN GEORGE: I thank you very much for your testimony.

I thank you and your colleagues for coming before us. It's most important that we continue to deal with these matters with facts rather than emotion. Thank you.

Are there any questions for the gentleman?

REPRESENTATIVE ROSS: I have one brief one, but maybe we need to stop.

CHAIRMAN GEORGE: Well, let me say this to you, Mr. Ross: I'm told that as soon as they take session, we'll be going to caucus.

REPRESENTATIVE ROSS: Okay.

CHAIRMAN GEORGE: So with that, I know how you and I don't like caucus and we're willing to stay here.

I recognize Mr. Ross.

REPRESENTATIVE ROSS: Thank you, Mr. Chairman.

I love caucus, but I love these meetings even more.

So one question I have, and it relates to the last question that I asked the previous speaker, the Professor.

I'm concerned about what temperature you're going to be operating and what temperature you're going to get your flue gases to that are going to be discharged. Do you or the consultants you have with us know about that, bearing in mind the concern about possibly releasing chemicals to atmosphere that might wind up being converted into something that is going

to create a new problem.

We are trying to get away from one problem, and I certainly recognize the benefits of what you are attempting to do here, but I just don't want to see us getting into an X range of unintended consequences here.

MR. HERB: I will defer that to our engineering team.

REPRESENTATIVE ROSS: In other words, if we're merely drying, that certainly isn't going to get us up to a hot enough temperature to make sure that those gases are going to be prevented from being formed and released.

MR. WEIR: This process -- and I'll take this question.

My name is Bob Weir. I'm with Entech Engineering.

REPRESENTATIVE ROSS: You might want to come to the mike, with the Chairman's permission.

CHAIRMAN GEORGE: If you will state your name for the record, please.

MR. WEIR: My name is Bob Weir. I'm with Entech Engineering.

The process that we are doing here at Exeter Township is not incinerating. So what we would be

doing with the dryer would be simply driving the moisture out of the sludge, so there are no flue gases from this process.

It is essentially driving the moisture out of the cake, and then the moisture that is driven off in steam will then be sent through a condenser where it is run back through the head of the treatment plant. So there is no---

REPRESENTATIVE ROSS: You are capturing all the products of combustion and recycling them?

MR. WEIR: There is no combustion of the sludge with this process, though. That's the difference with---

REPRESENTATIVE ROSS: You hope.

Mr. Chairman, if I could have a brief followup.

The other concern I had also is that you are talking about taking your solids and then supplying them as an additional fuel. And again, there's a question of whether anything will actually volatilize off at that point because of the temperature that it may or may not be reaching. And again I would raise the question about that, since that is potentially being sent off to another process that you're not in control of.

MR. WEIR: Well, again, that is one of the options that Exeter Township is looking at.

I believe right now, even as Mr. Herb had stated, one of the concerns is the cost of landfilling all of the cake product. So if we can reduce the amount, that is great.

If there is an advantage and if there is an opportunity to use it as a fuel source, we would still go and pursue some of those avenues.

REPRESENTATIVE ROSS: And just to close, Mr. Chairman, I have heard of other processes where there is a pyrolysis, as was mentioned before, where we are burning it at an extremely high temperature, capturing all of the products of combustion, maintaining and separating gases out, reusing them for a variety of other purposes -- a completely contained system with the solids being reduced to a glass essentially, which could be recycled in a different way, a completely closed-loop operation, and I worry about something that is a little less complete in terms of the combustion for the reasons that I have indicated.

And I just raise this, not to be a nuisance, but we got into this situation of the land application because, for good and sufficient reasons,

sewage treatment facilities wished to reduce their operating costs and tried to reuse some of the products that they were generating.

We don't want to make the same mistake with this process as well, where we release other kinds of pollutants onto the land and inadvertently wind up creating a new set of problems. So that's the reason why I raised this.

Thank you.

I'm complete. Thank you.

CHAIRMAN GEORGE: That concludes the interrogation. We thank the gentlemen for presenting this to this committee. Thank you very much.

We still have 10 minutes, so we call, without further hesitation, George M. Myers, Superintendent of the Milton Regional Sewer Authority; and the gentleman, E. Charles Wunz, Executive Vice President of HRG.

Welcome, gentlemen.

MR. MYERS: Thank you, gentlemen. I know time is running short, so we'll get right to it here.

We have prepared our testimony in the form of a narrated PowerPoint presentation.

But first, as one of the largest producers of biosolids in central Pennsylvania, I can tell you

that biosolids are land applied, as we have heard here in previous testimony, because the cost of land application is relatively low and the cost of competing disposal options is relatively high.

But what I hope you will learn from our presentation is that projects like the Milton project we are going to describe and the Cove Area Regional Digester project out in western Pennsylvania, both of these projects can greatly reduce or perhaps even eliminate the need to land apply biosolids while producing renewable energy and renewable fuels.

So I'll ask Angela to start the presentation. I can tell you it is exactly 10 minutes.

(A PowerPoint presentation was shown):

MR. MYERS: Thank you for this opportunity to present to the House Environmental Resources and Energy Committee.

My name is George Myers, and I'm the Superintendent of the Milton Regional Sewer Authority. And with me is our consulting engineer, Chuck Wunz, who works for Herbert, Rowland & Grubic, Inc.

We would like to start our presentation with a question.

True or false? Efforts to produce cleaner effluents from Pennsylvania's and the nation's publicly owned wastewater treatment plants, also known as POTWs, result in even larger volumes of biosolids, which is the name given to sewage sludge, and is consuming more and more energy to do it. In other words, the cleaner you make the wastewater, the more stuff you take out of the water, the more sludge you produce and the more energy you consume.

The answer is "false." The amount of biosolids produced is more a function of the treatment processes utilized to provide the required degree of treatment. Similarly, the amount of energy consumed to treat wastewater is a function of the processes selected.

We are here, in fact, to tell you about the project soon to be bid at Milton, Northumberland County, Pennsylvania, that will expand the plant, produce a cleaner effluent, produce renewable energy, produce renewable fuel, and with no biosolids needing disposal. We need your support to do this project.

Currently, the Milton Wastewater Treatment Plant is like every other wastewater treatment plant in Pennsylvania, and we produce one heck of a lot of biosolids.

Biosolids come from the primary treatment and secondary treatment steps at the Milton plant. I am standing here at the primary clarifier where primary sludge is generated.

The secondary sludge and the majority of the biosolids produced at the Milton plant come from this step. This is the activated sludge process where we have 800 horsepower aerating the contents of these two tanks.

These are our sludge digestion tanks. Upon completion of processing in these tanks, the biosolids could be hauled to permitted farmlands, as we once did, but are now processed through a dewatering step so they can be transported to the Lycoming County landfill.

This is the centrifuge that we utilize to dewater our biosolids. The centrifuge consumes 175 horsepower.

Here we see the dewatered biosolids being conveyed into two roll-off containers. When the containers are full, the sludge is hauled to the Lycoming County Landfill for final disposal.

Now I would like to turn the program over to Chuck Wunz, who will tell you about how we will be changing the plant so that it will be producing no

biosolids needing disposal.

MR. WUNZ: The Milton Wastewater Treatment Plant currently produces and ships 10,400 tons per year of biosolids to the Lycoming County Landfill, making it the landfill's second largest customer. That is 20,800,000 pounds going to the landfill each year at a cost to Milton of $400,000. When our project is complete, the amount of biosolids going to the landfill will be zero.

Our project will produce 2,190 tons of renewable fuel each year, having the same heat production capacity as the burning of wood chips, about 7,500 Btu's per pound, and with a value of $100,000. The net savings to Milton is $500,000 per year.

This is a graphic artist's rendering of the proposed treatment plant. The background is an aerial photograph. The packet we have distributed shows this same slide.

The anaerobic process is in the big new tanks on the right. The activated sludge process is in the center of the slide.

The current electric bill at the plant is $400,000 per year. After the project is complete, the bill for electricity will be zero.

America's environmental engineers are in love with activated sludge treatment, but the activated sludge process produces about five times more sludge than an equivalent anaerobic treatment/activated sludge hybrid process.

We all should be considering anaerobic treatment technologies at every opportunity, because less biosolids will be produced and less energy will be consumed.

In some cases, like Milton, biosolids requiring disposal will be zero and energy consumption from outside sources will be zero.

This is a description of the anaerobic treatment process. Different microorganisms work together to process complex organics into methane and carbon dioxide. More energy is generated than is required for mixing.

Many of these organisms are the oldest living species known to man. Instead of growing cell mass and creating excess biosolids, the process generates primarily two gases -- methane, which is about 75 percent of the total volume, and carbon dioxide, which is almost all of the rest.

Legislators and regulators need to recognize that the ways we adopted in the 1970s to treat our

wastewater need to change. Electricity is ever more expensive, and biosolids disposal problems are always with us.

PENNVEST rankings for the rating of projects are largely unchanged from the time PENNVEST was formed. What about changing the rating process to give a project like Milton's a priority because it eliminates biosolids disposal and produces renewable energy? If you don't, PENNVEST will not fund this project.

These are the reasons the Milton project is important to Milton's sewer customers. The reasons for you to support the Milton project and adopt it as a model are to demonstrate that treatment processes can produce zero biosolids that otherwise would need to be disposed of and can also produce renewable energy and renewable fuels. This can be done.

With design flows increasing by 32 percent and design organic loading increasing by 290 percent, the hybrid anaerobic/activated sludge treatment process at Milton consumes 30 percent less energy than the current plant, and in the future, all of that energy will be generated onsite.

In addition, about 50 percent of the energy generated at the plant will be sold to the PJM

electric utility grid.

There are over 1,000 sewage treatment plants in Pennsylvania. How much renewable energy and how much renewable fuel can they produce? How much can the greater use of anaerobic treatment processes reduce the volumes of biosolids generated?

MR. MYERS: In addition to being a poster child for energy efficiency, renewable energy production, renewable fuel production, and innovation in reducing biosolids production, the Milton project provides capacity to allow ConAgra to expand to add to its 950 high-paying union jobs by bringing new food production lines to Milton and fosters a brand new job-creation concept -- high strength wastewater industrial parks.

What city or town wants a new industry that has high strength discharge without forcing the industry to pretreat its wastewater? Milton does.

These are how the costs of the project break out. We provided them for your later review and study.

Thank you for this opportunity to present to the committee. Thank you for your attention, and thank you for your support in recognizing the importance of the Milton project.

CHAIRMAN GEORGE: Now, let me ask, is there a transcript that we can use and provide to the stenographer of that? If you could do that, we would be most appreciative.

MR. MYERS: We did bring along some CDs, and we'll be happy to do that.

CHAIRMAN GEORGE: Well, give them to the staff, if you will, and we will definitely see that the entire staff, those and the membership, will get a copy of this on the completion of all that has been provided in testimony.

MR. MYERS: Thank you.

CHAIRMAN GEORGE: And I thank all of you that have presented.

Before I'm finished, I would be remiss if I didn't thank Helane Shields on behalf of the *sludgevictims.com*. And her testimony, is it within your hands at this moment? If not, you can give this testimony to the stenographer, please.

And let me say this, that this will not be the end of our effort to get to the answers that I'm sure are there. They can make this much more responsive, much better for all concerned, and relieve the concern that has been continually with many of our people.

I apologize for the shortness. I'm going to turn one second, with the agreement of the committee, to the gentleman, Mr. Kessler, who has worked so hard to bring this to our effort.

REPRESENTATIVE KESSLER: Thank you, Mr. Chairman.

We have seen some exciting alternatives here for biosolids. As I recall, George had mentioned to me that their electric bill runs around $360,000. Is that correct, somewhere around there?

MR. MYERS: That is correct, and with the increase, we are going to be pushing over $400,000.

REPRESENTATIVE KESSLER: Okay. Where they will be able to generate enough methane from the biosolids to be self-sufficient, and then, in turn, take those biosolids and turn it into a fuel. We have heard that as well from Exeter.

I would like to read just one line of testimony from Dr. Murray McBride. It read:

"As the National Research Council 2002 Biosolids report observed, the EPA rules are out of date and there is a need to update them. These rules do not regulate a single synthetic chemical, and provide soil loading limits for only 8 metals...."

Talking to Dr. McBride, there are other metals that are being tested that also need to be revisited. Those regulations were put in in 1993 and have not been revisited, and we have a lot new data where they need to be revisited. And my understanding is that Pennsylvania does go by those EPA standards, but Pennsylvania does have the ability to regulate that even more than the EPA standards.

Thank you, everybody, for the testimony, and I want to thank all the other Representatives for attending.

CHAIRMAN GEORGE: I thank the gentleman, Mr. Kessler.

If there is no other business before this committee, this committee stands adjourned.

(The hearing concluded at 11:20 a.m.)

SUBMITTED WRITTEN TESTIMONY

*** * ***

HELANE SHIELDS, resident of Alton, New Hampshire, on behalf of *www.sludgevictims.com*, submitted the following written testimony:

It is shortsighted to suggest the only way to get rid of toxic/pathogenic sewage sludge "biosolids" is landfilling, incineration or land spreading. Sludge spreading, with its vile odors and swarms of filthy flies, is a public health risk.

Airborne dusts, gases and pathogens make people sick. Sludge has killed livestock and contaminated land and water. Family pets track this pathogenic waste into homes on their feet and fur, exposing residents to illness.

Europe and Japan are rapidly discontinuing land application to preserve their agricultural soil untainted. They are reducing their dependence on imported oil, and reducing greenhouse gases by utilizing new, non-polluting technologies such as pyrolysis, gasification and plasma arc incineration to convert sewage sludge from contaminated waste to a valuable renewable resource to cleanly and economically produce biogas, heat, electricity, power and energy.

RECOMMENDED LINKS FOR FURTHER INFORMATION

www.usludgefree.org/basic.htm

www.usludgefree.org/alternatives.htm

Alternative Uses Chart

http://www.usludgefree.org/AlternativesChart.pdf

Today's new thermal (heat) treatment technologies are NOT the pollution belching incinerators of the past.

RECOMMENDED LINKS FOR FURTHER INFORMATION

December 2009 -- 35-page update on clean energy alternatives.
http://sludgevictims.com/documents/ALTERNATIVES_DE_09 UPDATE.doc

Explanation of gasification of sewage sludge "biosolids"
http://sludgevictims.com/documents/alternative-Syngas-MaxWest.doc

January-August 2009 -- Alternatives (III) to Land Application of Sewage Sludge or "biosolids"
http://sludgevictims.com/documents/ALTERNATIVE2009III.doc

2008 sampling of alternative sludge uses

CANADA -- Two plasma arc assisted sludge oxidation-to-energy plants are under construction in Canada -- one in Hamilton and the second in Quebec (which has a moratorium on spreading sludge on province farms.)

* * *

STAMFORD, CONNECTICUT -- The town's pollution control authority has started turning the sludge extracted from its wastewater treatment plant into electricity through a process called gasification.

The town also turns the sludge into solid pellets that it sells as fertilizer to the state of New York.

* * *

Fla. city will turn wastewater sludge into green energy

Sanford, Fla., has entered a long-term contract to have the city's wastewater sludge converted to green energy.

Under the 20-year deal, Houston-based MaxWest Environmental Systems Inc. will dispose of Sanford's biosolids by gasifying the material to produce a synthetic gas. A thermal oxidizer then will convert the syngas into renewable thermal energy.

"Traditional disposal methods for biosolids are becoming more expensive, publicly unacceptable and potentially harmful to the environment," he said.

"Compared to the projected cost of natural gas, a fossil fuel, Sanford will save $9,000,000 over the 20-year life of our contract," said Paul Moore, Sanford Utility Director. "This technology has provided us with the opportunity to save money while managing our waste stream and protecting the environment."

* * *

"Carbonization of Waste is a University of Hawaii-based Trash Management Option"

By Panos Prevedouros, PhD

HAWAII -- Technology developed by University of Hawaii researcher Michael J. Antal, Jr., to

produce charcoal from green waste can reduce the burden on the Waimanalo Gulch landfill.

Dr. Antal's flash carbonization process uses heat and pressure to turn scrap tires, corn cobs, macadamia nut shells and green waste into a high-quality, clean alternative to wood or coal.

Flash Carbonization™ of raw sewage sludge produced in Honolulu's Ewa treatment plant was converted into charcoal. Charcoal yields of about 30% (dry basis) were produced from the sewage sludge.

Charcoal is the sustainable fuel replacement for coal. Coal combustion is the most important contributor to climate change. On the other hand, the combustion of charcoal-sustainably produced from renewable biomass -- adds no CO2 to the atmosphere! Thus, the replacement of coal by charcoal is among the most important steps we can take to ameliorate climate change.

* * *

ILLINOIS -- The North Shore Sanitary District's new sludge recycling facilities are the first in the world to convert municipal biosolids

into a reusable glass aggregate.

Each day, up to 200 tons of municipal biosolids are transformed into 7.5 tons of glass aggregate using an innovative drying and melting process.

* * *

CROWN POINT, INDIANA -- Algaewheel, Inc. announced today that they will be submitting a proposal to build a facility in Cedar Lake, Indiana, that uses algae to treat municipal wastewater and uses the sludge byproduct to produce electricity, heat, and biofuel.

"This collaborative project between the District and the design engineer, Donohue & Associates, Inc. has resulted in the successful implementation of the most environmentally sound biosolids disposal ever developed.

"The glass aggregate has no risk of soil or groundwater contamination since microorganisms in the biosolids, such as bacteria and viruses, are destroyed through the heating processes. Trace metals and other inorganic materials that may be present are permanently stabilized within the glass

matrix and can not seep into the environment."

* * *

Sewage sludge converted to energy

(http://desmoinesregister.com/apps/pbcs.dII/article?AID=/20071213/NEWS/71213014)

The Metropolitan Wastewater Reclamation Authority has begun converting sewage sludge into an energy supply to heat its facility.

A MicroSludge System was installed at the WRA facility, 3000 Vandalia Road, this fall. The system takes sewage sludge from the facility and converts it to biogas which contains methane and can be used by power generators. The system is expected to process at least half of the sewage sent to the facility.

* * *

http://www.metrocouncil.org/about/facts/MetroPlantSolidsMgmt.pdf

MINNESOTA -- The sewer plant at St. Paul did an economic study that demonstrated that it was safer

and cheaper to use their fluid beds to burn sludge than to land apply it. They more than meet air requirements. They replaced six old incinerators with 3 fluid beds and, although their old system met EPA air requirements, their new system (the 3 fluid beds) reduced the former air emissions by 98%.

* * *

Council OKs methane project

Plan is to turn waste sludge into electricity

SCHENECTADY, NY -- "Veolia Water employee Jim Versocki shows one of the two digesters at the Schenectady Water Treatment Plant Monday. The digesters break down sludge, which produces methane gas. The hope is to use the methane gas to run generators and produce electricity.

" 'The project will allow us to not only capture the methane and generate electricity with it but to benefit the environment further by not releasing the methane,' he said. 'It's a wonderful program, a win-win both environmentally and financially for the city.'

"The city plans to spend another $1.5 million to harness the methane. City officials plan to take out a $2 million bond for the full expense, which could be paid back in less than seven years if the city uses all of the money saved by the project."

* * *

CH Energy to build a $9.75M biogas plant in NY

POUGHKEEPSIE, NY -- The facility will use gas from an adjacent wastewater treatment plant to generate electricity.

Poughkeepsie, N.Y.-based CH Energy Group (NYSE: CHG) announced a long-term contract to supply electricity to the city of Auburn, N.Y., from power generated using biogas from a wastewater treatment plant.

Under the 15-year deal, CH Energy will construct and operate a 3 megawatt electricity generating plant adjacent to a municipal landfill and wastewater treatment facility in Auburn.

* * *

OHIO -- Since mid-October, Akron and KB Compost have been fine-tuning the plant that turns sludge from the city's sewage treatment plant into a methane-rich biogas that powers an electric generator.

* * *

New process converts urban waste to gasoline

COLLEGE STATION, TEXAS -- A process for turning everyday waste into gasoline, developed through the Texas A&M University System, has been licensed to Byogy Renewables Inc. and could become a reality within two years.

Researchers with the Texas Engineering Experiment Station (TEES), the engineering research agency of the State of Texas, developed the process to make converting biomass into high-octane gasoline possible, and say it is possibly the only integrated system that does so, as most other emerging processes convert the biomass into alcohol and then blend it with gasoline.

* * *

BIOGAS FROM SEWAGE

(http://www.erosioncontrol.com/de_0511_fuel.html)

"The fuel cell, located at the South Treatment Plant in Renton, WA, can consume about 154,000 cubic feet of biogas a day to produce up to 1 MW of electricity. That's enough to power 1,000 households, but it's being used instead to help operate the plant.

"The fuel cell's electric output will save the Wastewater Treatment Division (WTD) of King County's Department of Natural Resources and Parks about $400,000 a year -- money that otherwise would be spent to buy electricity from the local utility, Puget Sound Energy, a subsidiary of Puget Energy Inc., of Bellevue, WA. Other savings, yet to be determined, will come from waste-heat recovery and reduction of biogas scrubbing costs.

"About 400 sewage treatment plants in the US have anaerobic digestion and receive at least 30 million gallons of influent a day, the minimum necessary to justify installation of a fuel cell the size of King County's. For smaller treatment plants,

FCE offers a 250-kW fuel cell that can be installed in multiples to produce 500 kW or 750 kW."

* * *

GERMANY -- The organic matter used can be pretty much any biodegradable material: food waste from households, markets, shops, restaurants, caterers, breweries, distilleries, industrial kitchens and companies that process food and drink; abattoir waste; agricultural waste like manure, slurry, straw, feathers and crop residues; industrial waste and residues from, say, pharmaceutical processes of paper manufacturing; and sewage sludge.

After being compressed, the biogas or biomethane is ready to be used. Obviously, the best place to do this and make the most out of the energy is to burn it in a combined heat and power plant -- the most efficient way possible to burn a fuel -- where it generates both electricity and heat.

* * *

Mitsubishi Builds SlurryCarb™ Demonstration Facility in Kusatsu, Japan

JAPAN -- EnerTech's patented SlurryCarb™ process cleanly and economically converts biosolids (sewage sludge) and other high moisture wastes into a high-grade, renewable fuel, with significant cost savings over alternative methods.

* * *

Sweden pushes biogas as gasoline substitute

By James Kanter, International Herald Tribune

GOTEBORG, SWEDEN -- Taking a road trip? Remember to visit the toilet first.

This city is among dozens of municipalities in Sweden with facilities that transform sewage waste into enough biogas to run thousands of cars and buses.

* * *

California and Sweden Joint Biogas Initiative

(http://biopact.com/2007/07/schmack-biogas-and-eon-to-build-europes.html

(http://www.euractiv.com/en/sustainability/biogas-promising-future-eu-study-shows/article-165771)

Recognizing they have similar vehicle fuel problems and similar long term goals, the US state of California and Sweden have inked a deal to jointly develop biogas for motor vehicle fuel.

Using California's market muscle and technology research industry combined with Sweden's proven track record on the practical production of biogas, they hope to eventually end dependence on foreign fossil fuels.

Biogas has a huge potential on a global scale, with some experts seeing it so large that the plant based methane could replace all of the EU's natural gas imports from Russia by 2030.

* * *

BIOMASS
MAGAZINE

From the June 2009 Issue

Florida city to use sludge-to-energy gasifier

by Lisa Gibson

Sanford, Fla., will be the first municipality in the country to convert wastewater sludge to energy using

MaxWest Environmental Systems Inc. gasification technology. The resulting syngas will be used to power the city's sludge dryer at the South Water Resources Center.

The city is leasing the equipment over the next 20 years from MaxWest, which will operate the system, and expects to save about $9 million on natural gas alone during that time. "That's the beauty of this project," said Charlie Turner, Sanford utility plant manager. "We didn't buy this. It's going to be a lot easier for us." The payments are about the same as the cost of purchasing natural gas, he added. Savings could amount to much more, as the city plans to look into using other feedstocks for the gasifier in the future, and possibly to produce electricity. "That would be very exciting," Turner said. "Who knows how much we could save."

Turner hopes the gasifier will be up and running in the next week. "We are just completing construction," he said. "We haven't actually run the unit except to test." The gasifier will consume about 30 to 40 cubic yards of biosolids -- the end product of a sewer plant -- per day to start with,

working toward more. The facility will run 24 hours a day, producing 7 million British thermal units of renewable thermal energy per hour, according to MaxWest. Turner hopes other cities in the region eventually will contribute their wastewater sludge and other waste materials once the project expands.

MaxWest's gasification technology takes biosolids and feeds it into an enclosed primary gasifier to produce syngas. In a continuous integrating process, the syngas is oxidized in an enclosed thermal oxidizer to produce renewable thermal energy.

Besides saving the city money, the technology will be beneficial in disposing of dried residuals, which has been met with opposition from the public. Community members seem to be embracing the new process, Turner said. While Sanford is the first to commit to the gasifier, MaxWest is in discussions with other municipalities and industries in the U.S. and Canada, according to the company. The Sanford site will be a showcase for the technology, demonstrating its effectiveness, MaxWest says.

"We've got big hopes," Turner said. "We want it to be successful."

I hereby certify that the proceedings and evidence are contained fully and accurately in the notes taken by me on the within proceedings and that this is a correct transcript of the same.

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Debra B. Miller, Reporter