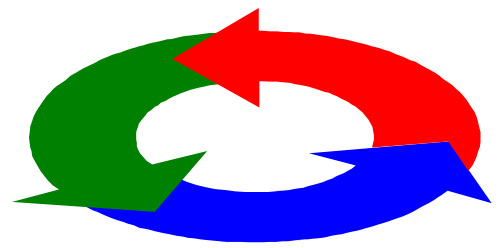


Amendments



Improving Awareness & Advocacy of the Michigan Biosolids Program

Volume 17, Second Quarter

May, 2013

Biosolids Program Update

Biosolids Conference

The Michigan Biosolids Team held their annual conference on **March 6 and 7, 2013**, at the Double Tree Hotel in Detroit. The Theme for the conference is ***Biosolids Management Trends and Marketing***. The first day featured a tour of City of Detroit Water and Sewer District (DWSD) Waste Water Treatment Facility. This is the largest Waste Water Facility in the United States. A number of our participants in the tour were employed at this facility so the historical perspective was very interesting. Even though they were not running solids that day, it was still a very nice tour.

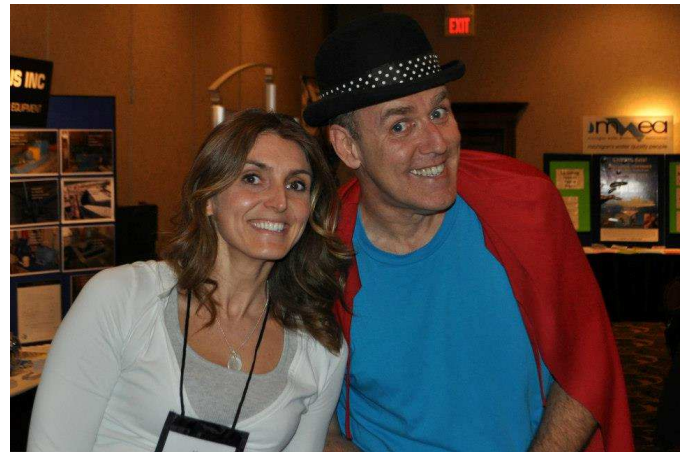


After our evening meal, Mike Person was crowned the new Baron of Biosolids by the 2011 recipients, **Kim Hackbardt and Don Uitvlugt**.



The 2013 Baron of Biosolids, Mike Person!

The evening entertainment from comedian/magician Keith Fields who put on a great show!



Keith with Kari Stuart

Changes to the speaker lineup for the second day gave the planners some anxiety but they none the less turned out pretty good. Dr. Todd Anderson of Texas Tech University gave a good presentation on the fate of pharmaceuticals and personal care products in soils. There were also three good presentations on Bio-Gas generation and presentations on Management Trends, Land Application vs. Landfilling, Marketing, and solar drying.

MSU Agricultural Exposition

The Michigan Biosolids Team will again display at the 2013 MSU Ag Expo, July 16-18. We were going with wheat for our demonstration, but the plot was damaged by vehicles running through it because of high water this spring before a fence can get erected.



April 16, 2013



April 23, 2013

We will now be growing corn in the plot for 2013. Additional Biosolids and fertilizer have been applied, respectively, on May 3, 2013 and the plot tilled on May 6. Delta Township again provided the biosolids.

Mike Person named State Biosolids Coordinator

Mike Person, Biosolids program staff person for the Saginaw Bay and Cadillac Districts, and acting State Biosolids Coordinator, has been officially offered and has accepted the position of State Biosolids Coordinator. Mike will still cover one district along with his Biosolids Coordinator responsibilities. More details to follow. Congrats Mike!

Biosolids Workshop

Dr. Lee Jacobs, Professor Emeritus at Michigan State University, facilitated a two day workshop titled: *Utilizing Municipal Biosolids on Agricultural Land*, on May 8 & 9, 2013, at the Comfort Inn in Mount Pleasant. This workshop, sponsored by the Michigan Water Environment Association, covers topics such as basic soil science and plant nutrition, soil testing, fertilizer recommendations, calculating biosolids application rates, biosolids regulations, and the Michigan Biosolids Team Educational Activities.

Lee stated he enjoys this two day program and is willing to do this workshop in 2015.

Michigan News

Saginaw wastewater treatment plant handles heavy volumes from spring rains

By Mark Tower | mtower@mlive.com

April 10, 2013 at 12:40 PM, updated April 10, 2013 at 12:41 PM

SAGINAW, MI — Since Monday, April 10, the Saginaw area has received more than two inches of rainfall, which has caused the city's wastewater treatment plant to work at full capacity. The Saginaw Wastewater Treatment Plant treats all water going down city drains, including industrial, sanitary and storm sewer waters.

Using seven retention basins along the Saginaw River, the facility uses chlorine screening and settling processes to treat all the water before it is released, according to Plant Superintendent Jeanette Best.

"We never put any untreated water out," Best said.

On a typical day, the plant treats and releases about 15 million gallons of wastewater into the Saginaw River. Currently the plan is pushing through the maximum capacity of 70 million gallons, Best said. "We've had just a horrendous amount of rain," she said.

Three of the seven retention ponds were discharging into the river on Tuesday, Best said.

The entire wastewater treatment system, including all seven ponds, can hold 61 million gallons of water, she said. Once that capacity is reached, the water being held in retention ponds is released into the river.

"If we didn't do that you would wind up with your basement as a retention basin," Best said. Once the rainy weather stops, Best said a report will be released with the total number of gallons flowing through the facility since the rains began.

Chelsea Standard

Serving Chelsea, MI and surrounding communities

Tuesday, March 12, 2013

SYLVAN TOWNSHIP: Wastewater treatment plant woes continue to dog township

Published: Thursday, March 07, 2013

By Sean Dalton sdalton@heritage.com
Twitter: [@seankdalton](https://twitter.com/seankdalton)

Problems at the wastewater treatment plant continue to plague Sylvan Township.

Sylvan Township Water and Sewer Authority Treasurer Mike Jurosek spoke with the township board at their regular meeting March 5 about the situation at the wastewater treatment plant.

In January, non-routine maintenance at the plant exceeded \$20,000, according to Jurosek's report, which itemized the repairs, including a pump replacement at Waterloo Road, and communications at two lift stations, the cleaning of one lift station.

To put that monthly figure in perspective, the total non-routine maintenance for the plant during the entirety of 2012 was \$82,000. This year "we're in the hole before we even got started," Jurosek said.

To add to the list of repairs, wiring on a control panel at the township hall lift station caused a "very minor" overflow that required Leoni's crews to respond and will result in a [Michigan Department of Environmental Quality](#) inquiry.

"It was a pretty minor leak ... it was taken care of by the time we got there," Jurosek added.

The proposed budget includes \$45,000 for work on the water system's iron removal system, which Jurosek also discussed.

The system is a necessity to remain in compliance with DEQ water quality requirements for iron and magnesium. It will cost the township \$46,000. To make up the difference, the township will have to pull \$1,000 from its \$25,110 contingent fund.

Jurosek also reported on the latest meeting with the Chelsea officials, which he said went much better than [a previous such meeting with the now ousted township](#)

[board](#), according to his report.

"It was a nice sit-down to get to know each other," Jurosek said. He added that a possible future connection was talked about, but that the matter wasn't looked at "at a very high level."

The public fired off questions at Jurosek about past and future costs in light of the maintenance he was talking about, to which he responded with frustration that the system was built for 5,000 customers and is currently serving less than 60. "It's going to go on ... we're going to owe more money," he told the crowd.

Township Supervisor, Scott Cooper, interjected the maintenance is like "putting oil in your daughter's car that you bought ... the plant was built by the township and we have a responsibility to maintain the integrity of that."

"I don't think people are really aware of what these two systems are costing us ... those people who don't have these services," Jurosek said. "In reality, we've got 57 customers, I mean, it's ridiculous."

Jurosek added the authority's "hands are tied" because all that entity has the power to do is bill customers.

"We will probably have to ask for help whenever a huge project like this comes along," he explained. "It's going to get tacked onto your tab until we get customers."

Township resident Judy Slocum asked the board if the customers at Chelsea Springs and the trailer park that are within 20 feet of the city's lines, according to her, could hook up to Chelsea's system so the township could mothball the plant until development warrants its operation.

"Is it a possibility for the city to take them on as water customers and then for us to look at costs (of) what it would cost to shut it down (and) what it would cost to open it back up," Slocum said.

Cooper said that "all of that is on the table (and) all of that is being discussed."

Staff Writer Sean Dalton can be reached at 734-429-7380 or sdalton@heritage.com. Follow him on Twitter [@seankdalton](https://twitter.com/seankdalton). Text HERNews and HERWeather to 22700 to receive news and weather alerts to your cellphone. Msg and data rates may apply. Text HELP for help. Text STOP to cancel.

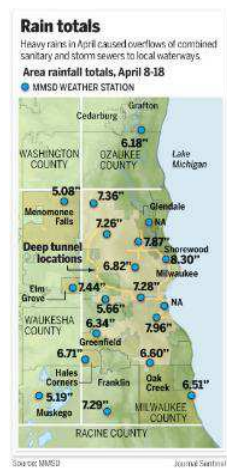
Wisconsin



Milwaukee Metropolitan Sewerage District aims for zero wastewater overflows by 2035

By Don Behm of the Journal Sentinel

April 27, 2013



Shafer acknowledged the public likely will be skeptical of the district's ability to deliver on a pledge of zero by 2035 following two downpours this month.

Combined sanitary and storm sewers in central Milwaukee and eastern Shorewood poured a total of more than 1.1 billion gallons of untreated wastewater to local rivers and Lake Michigan during two overflows.

The volume of each overflow - 594.8 million gallons from April 10 to 13 and 524.9 million gallons from April 18 to 19 - would have filled a deep tunnel system equal in size to the existing one, with water to spare.

"No matter what we build, there will always be a bigger storm," said Tim Bate, the district's director of planning, research and sustainability.

From April 8 to 18, a district rain gauge in Shorewood measured 8.3 inches of rain. Close behind was the 7.96 inches on Milwaukee's south side, 7.87 inches on the city's north side, 7.44 inches on Elm Grove and 7.29 inches on Franklin.

The deluge pushed this month to the wettest April on record for Milwaukee through April 25, the National Weather Service said.

Bate looks at each storm as the major source of water to regional sewers and treatment plants for the duration of a downpour.

Rain infiltrates pipes

Preventing combined sewer overflows of 500 million gallons or more as occurred in each deluge this month can be done by reducing the amount of water coming in to the front end of the system: private sanitary sewer laterals and municipal street sewers.

Water from rains on April 17 and 18 was still coming into the regional system on April 26. The South Shore sewage treatment plant in Oak Creek, which receives flows only from communities with separate sanitary sewers, was treating 140 million gallons of wastewater on Friday. Normal dry day flow to the plant is between 65 million and 70 million gallons.

Overflows to waterways are an emergency measure to prevent backup of sewage into basements. Sewage backups damage property and pose a risk to public health.

No sewer overflows by 2035. Zero.

That is the Milwaukee Metropolitan Sewerage District's goal. But it does not plan to prevent all overflows by building more additions to the deep tunnel.

Though state environmental regulators and district officials consider the tunnel a success, the old strategy of attempting to contain most of the wastewater that flows into regional sewers has been put aside.

The new direction is to keep storm water out of sanitary sewers so there is less need for building more and more costly storage, MMSD Executive Director Kevin Shafer said.

"The public wants us at zero" overflows, Shafer said. "We are at an average of 2.4 combined sewer overflows a year now," he said. "To protect the environment and protect public health and safety, we do need to set a goal of zero."

The tunnel's first full year of operation was 1994. Before the tunnel came on line, there were 50 to 60 combined sewer overflows a year to the rivers and lake.

Achieving zero without building another storage tunnel will take 20 years to put in place, but separate pieces of the strategy already are showing progress, Shafer and Bate said.

MMSD is working with municipalities and landowners on two fronts to accomplish the goal: repairing private sanitary sewer laterals between residences and street mains to reduce leaks of storm water into the pipes; and planting specially designed rain gardens on lawns or planting grasses and other vegetation on building roofs - known as green infrastructure - to hold rain rather than letting it flow into sewers.

The district will lean on green infrastructure alone to capture 740 million gallons of water in a heavy downpour by 2035, said Karen Sands, the district's manager of sustainability. That is the equivalent of the first half-inch of rain to fall on all paved surfaces, rooftops, and lawns in the district's service area.

Keeping 740 million gallons of rain out of sewers is equal to 1.4 times the district's total tunnel storage capacity of 521 million gallons.

While rain gardens, porous pavement in parking lots, green roofs, and replacement of turf grass lawns with native plants capable of absorbing more storm water will deliver the biggest punches, smaller successes will come from planting trees and setting out rain barrels.

The district has distributed 18,182 rain barrels since 2004, enough to hold 1 million gallons of water. As this program is expanded, rain barrels will be expected to collect 7.4 million gallons of rain water by 2035, or 1% of the total green infrastructure goal.

Cost of installing green infrastructure needed to capture 740 million gallons of rain is estimated at \$1.29 billion through 2035, under a draft regional plan.

For comparison, the district spent more than \$1.2 billion to build all of its storage tunnels, which total a 521 million gallon capacity.

Plugging leaks

The district's other front is below ground.

MMSD has established a 10-year, \$62 million regional program to upgrade residential sanitary sewer laterals in 28 communities within its service area. Laterals extend from a home to the sewer main beneath a street.

Shafer has described the \$62 million allocation through the year 2020 as the first installment for the long-term program.

Leaking laterals are a major source of clear water to municipal sewers during heavy rains. Filling street sewers with water in a storm can overwhelm regional collector sewers and fill the deep tunnel, leading to sewer overflows. Filling a street sewer increases the risk of sewage backups into basements.

Twenty-one of the municipalities have taken advantage of the program as of this month, said Jerome Flogel, senior project manager for the district.

This year, the City of Milwaukee is inspecting and repairing private sanitary laterals in the Samuel Clemens Elementary School neighborhood on the north side. More than 320 property owners have signed up for the project, and the city is continuing to enlist other volunteers, said Tim Thur, Environmental Manager for the Department of Public Works.

Most laterals will be lined to curb leaks of rain into the pipes and reduce flows of clear water to municipal sewers. Homeowners will not be charged for the work in this demonstration project, officials said.

Total cost is estimated at \$3.92 million if work is done at all 449 homes in the neighborhood. MMSD will contribute \$2.17 million to help pay for the project.

This is Milwaukee's second large neighborhood to be enrolled in MMSD's private lateral program.

Over the winter of 2011-12, contractors completed lining laterals of 526 homes in the Cooper Park neighborhood east of the Mount Mary College campus.

Fort Wayne works board OKs \$27.6 million sewage project

By Christian Sheckler of The News-Sentinel
Wednesday, March 6, 2013 - 4:10 pm

Fort Wayne officials Wednesday approved a \$27.6 million contract for improvements to the city's wastewater plant – a key facet of an ongoing federal mandate to reduce sewage overflows into local rivers. The city Board of Public Works selected Westerville, Ohio-based Kokosing Construction for the project, which will increase the plant's capacity to help avoid overflows during periods of heavy rain, said Matthew Wirtz, deputy director of City Utilities.

“The overall goal is to get the wastewater treatment plant capacity up to 85 million gallons a day, and now it's at 60, so it's a significant increase,” Wirtz said. “It's during these rain events, when we get more flow, is where we need higher capacity.”

The project is among three main projects the city is undertaking as part of the \$240 million agreement with the Environmental Protection Agency. The others are a \$25 million sewer pump station, currently under construction, and a huge \$100 million sewer pipe that will be built in phases over several years.

The EPA mandate requires the city to spend at least \$240 million on sewer improvements through 2025 to dramatically reduce the annual number of overflows into the rivers from the city's combined storm and wastewater sewers.

The sewage plant improvements will be paid for under a five-year rate plan approved in 2009 that nearly doubled the monthly sewer bill for an average City Utilities customer.

City Council still must approve the \$27.6 million contract, which City Utilities officials will introduce at Tuesday's council meeting, Wirtz said. Council could then discuss the contract as early as March 19.

Minnesota towns unhappy with proposed phosphorous regulations

Minnesota towns in the Red River Basin are fighting proposed regulations dealing with phosphorus discharged in the the rivers.

By: **David Schwab**, WDAZ

Minnesota towns in the Red River Basin are fighting proposed regulations dealing with phosphorus discharged in the rivers. The new rules would limit the amount of phosphorus released into streams to cut down on algae growth in Lake Winnipeg.

Phosphorus is a naturally occurring element. It is a byproduct of human and animal waste and is also used as a fertilizer. But too much in the water system can be an issue for lakes.

It's estimated that 46,000 pounds of phosphorus enter lake Winnipeg every day, and that has caused algae problems in the lake. The Minnesota Pollution Control Agency wants to cut the amount city waste water plants can release back into the river. Wayne Johnson at the Thief River Falls water plant says that it's agriculture runoff that is by far the largest source of phosphorus draining into Lake Winnipeg. He says the expensive chemicals needed to fix the issues would also cause the lagoons to fill with sludge. The MPCA wants to limit the amount of phosphorus released to one milligram per liter of water. At the same time just across the river in North Dakota there would still be no limit. Grand Forks Public director Todd Feland says regulation could come over the next decade. Feland says the issue is being studied by North Dakota, but thinks there may be other ways to lessen the about of phosphorus running into the river. Minnesota towns affected by the regulations say they are not done with this fight.

Many of the cities including East Grand Forks, Moorhead, Roseau and Thief River Falls have pledged to formally or informally fight the new phosphorus regulations.

Waste & Recycling News

Sewage sludge turns a profit for Kansas City

By Kerri Jansen

Wednesday, February 27, 2013

The fields of corn and soybeans at Birmingham Farm, owned by [Kansas City, Mo.](#), look like the crops at any other farm.

But unlike most farmland, these fields are fertilized with biosolids produced by the city's wastewater treatment process.

Each year Birmingham Farm uses about 55,000 dry tons of biosolids, sometimes called "sewage sludge," from the city's main wastewater treatment plant, Blue River. Its history stretches back to the 1970s when the city first started applying biosolids from a smaller treatment plant to 300 acres of farmland.

Prior to the farm's creation, the city incinerated all of its sludge, said Kurt Bordewick, manager of [Kansas City Water Services'](#) wastewater treatment division. The city bought an additional 600 acres in the 1980s and installed digesters at Blue River to generate biosolids for the farm. Over the next couple decades, the farm grew to more than 1,300 acres, farmed by tenant farmers who shared one-third of their gross revenues with the city.

In 2006, the city took over operation of the farm and now collects all of the income from its crops, averaging about \$350,000 per year after deducting the costs of seeds and farming operations, farm manager Tim Walters said. The city, which used to run two incinerators full-time, now runs one incinerator part-time and hasn't sent solid residuals to a landfill in more than seven years.

Material from Blue River is processed by digesters then pumped underground to lagoons at the farm where the sludge is allowed to settle. In the spring and fall, the liquid biosolids are sprayed onto the fields via an elaborate system of pipes, returning nutrients to the soil and helping support plant growth.

To prevent contamination problems, the city takes soil and surface water samples and maintains 18 groundwater monitoring wells, including four downstream along the Missouri River. Access to the farm is restricted as a further safety measure.

"We're in control of everything," Walters said.

The crops grown at the Birmingham Farm are not intended for direct human consumption. Harvested corn and soybeans are taken to a grain elevator owned by [Cargill Inc.](#), an international producer and marketer of agricultural products. A portion of the crops are used to produce biofuel; ethanol from corn and biodiesel from soybeans. The crops are also used for feed or industrial uses.

"We can't account for every soybean that comes out of the farm, but some of those soybeans go to generate biodiesel," Bordewick said.

The energy consumption of the farm is much less than the energy required to incinerate sludge, Bordewick said. Biosolids are only applied 30 days each year, so most of the time those pumps remain off.

"We feel we're ... greatly improving and enhancing our carbon footprint by going this route as opposed to incineration," Bordewick said.

Despite the stigma that sometimes comes with recycling sewage materials, the city has run into little opposition to the project, he said. One neighboring farmer expressed dissatisfaction, so "we offered him a good price for the property, and bought his farm," Bordewick said.

The biggest struggles for the city's biosolids project have been drought and mechanical troubles, he added. Drought can cut the farm's yield by as much as half, and Walters said he's lost several pumps to clogs and other unforeseen issues.

Nonetheless, Bordewick said he sees "a long future" of biosolids application at the farm.

"Hopefully we will procure more farmland and build more digesters to continue with this effort and get out of the incineration business altogether," he said.

Link:

<http://www.wasterecyclingnews.com/article/20130227/NEWS02/130229925?template=printarticle>

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Q-C's sewer bill: \$371 million

FEBRUARY 16, 2013 5:45 AM • [TIMES EDITORIAL BOARD](#)

Davenport's new agreement with the Environmental Protection Agency is the latest in environmental enforcement and planning that has committed Quad-Citians to \$371 million in sewer repairs this decade.

Almost every dollar will serve the same purpose: keeping wastewater out of the Mississippi River.

Davenporters will pay the lion's share of \$224.5 million to repair and seal a consolidated sewer system that serves Davenport, Bettendorf, Riverdale and Panorama Park. All feed into an ancient underground system that routinely gets overrun during heavy rains. Leaky sanitary sewers get overwhelmed with storm runoff, forcing discharges of raw sewage directly to the river.

East Moline residents approved 2007 referenda for \$39.5 million in similar sewer repairs.

Rock Island is spending \$70 million for the same reasons.

Moline hasn't faced EPA sanctions, but is planning to borrow \$37.6 million in 2016 to make sewer plant and system improvements for the same reasons.

All of the spending is in response to EPA rules discouraging combined storm and sanitary sewers. Much of the money will pay for expanded processing and submerged retention tanks, where sewage solids can settle out of storm runoff before it hits the river.

Collectively, that's more than a third of a billion dollars Quad-City sewer customers and taxpayers are committing to clean water over the next decade. Add millions more for the stormwater fees Quad-Citians are paying to keep silted runoff out of the river.

We're no fan of federal mandates, but this one is essential. Any community that relies on the Mississippi River for almost all of its drinking water should be the leader in sustainable water management.

Our community spends millions on riverfront trails, parks and overlooks. This infrastructure investment helps assure our primary water source is as safe to drink as it is pretty to look at.



The in-house research arm of the U.S. Department of Agriculture

The Real Dirt on Biosolids as Soil Amendments



Agronomist Eton Codling inspects wheat plants grown in biosolid-amended soils. Yields from some biosolid amendments were higher, but yields from lime-treated biosolids were severely reduced. The unhealthy plant on the left is growing in soil amended with lime-treated biosolids. **(D2710-1)**

The U.S. Environmental Protection Agency (EPA) estimates that more than 60 percent of dry biosolids—treated wastewater solids that can be recycled or stored—are applied to land, composted, or used to cover landfills. The biosolids have been processed to kill pathogens, and EPA strictly regulates biosolid use to ensure the materials don't harm the environment, human health, or animal health.

Farmers who follow pre- and postapplication management regulations can obtain permits to use biosolids for amending fields where food and feed crops are grown. Now, research by an [Agricultural Research Service](#) scientist is helping to clarify the long-term effects that biosolid amendments can have on some soil types—and how the amendments could affect crop production.

"Processed biosolids contain nitrogen and phosphorus that can be used for fertilizer," says agronomist Eton Codling, who works at the ARS Environmental Management and Byproduct Utilization Laboratory in Beltsville, Maryland. "They also contain copper, manganese, and zinc, which are plant micronutrients. But biosolids also have lead and cadmium, which can contaminate the soil."

Tracking a Timeline

Codling decided to investigate how long plant-available phosphorus and other minerals remain in soils amended with biosolids and how much

phosphorus, copper, cadmium, lead, manganese, and zinc was taken up by wheat grown on those soils. He measured mineral levels in three different soils that had previously received a single amendment of a biosolid processed via one of the following methods: high heat, additions of lime, anaerobic digestion, or air drying.

The amendments had taken place 16 to 24 years earlier during a series of studies on biosolid amendments, and they had been applied to the soils at several different rates. As part of the earlier work, the fields had been cropped after the biosolids had been added, so the biosolid nutrients in the experimental fields had been available for crop uptake for at least 16 years before Codling began his research.

Still, the scientist observed that phosphorus levels were generally higher in the biosolid-amended soils than in control soils, which strongly indicated that soluble phosphorus levels in biosolid-amended soils could exceed typical plant requirements for years after the addition of the soil amendments. This meant that the excess phosphorus could wash out of the biosolid-amended soils into adjacent water channels and contribute to the development of oxygen-deficient “dead zones.”

Codling also noted that phosphorus solubility varied with the biosolid type and application level. For instance, a soil amended with heat-treated biosolids contained higher levels of water-extractable phosphorus than the same soil type amended with lime-treated biosolids. This occurred even though the soil with the lime-treated biosolids had received amendments at levels that were three times that of the heat-treated biosolid amendment. The lime-treated biosolids had most likely sequestered phosphorus in low-solubility calcium phosphate compounds. Most of the biosolid-amended soils also had higher levels of plant-available cadmium, copper, and zinc than the nonamended soils, and soil mineral levels generally increased as amendment levels increased.

Crop Response

Codling then conducted a study in which wheat was planted in pots filled with each type of amended soil. The researcher observed that yields from wheat grown in three of the five biosolid-amended soils were higher than from wheat grown in control soils. The highest yields were recorded for wheat grown in soils amended with biosolids created via anaerobic digestion, and yields in these experimental soils increased as amendment levels increased. But yields from wheat grown in lime-treated biosolids were

severely reduced, probably as a result of manganese deficiency.

Codling also measured mineral levels that had accumulated in the above-ground biomass of the experimental crops. He observed that wheat grown in any of the biosolid-amended soils had higher phosphorus concentrations than wheat grown in the control soils. This coincided with the soil's elevated levels of plant-available phosphorus and provided additional indications that phosphorus was readily available for crop uptake 16 years after test soils were amended with biosolids.

Overall wheat tissue levels of lead were low, because most plants typically do not bioaccumulate lead to any significant degree. But tissue cadmium levels ranged from 1.2 parts per million (ppm) to more than 20 ppm in wheat cropped in the biosolid-amended soils. (Cadmium levels in the control soils averaged around 1.4 ppm.)

In addition, all the soil mineral levels were reduced after one cropping of wheat. Since Codling had collected leachate from each pot after watering and returned it to the pots, he surmised that the lower levels of extractable metals and phosphorus in the soils most likely resulted from plant uptake.

Taken together, these results, which are scheduled for publication in the *Journal of Plant Nutrition*, confirmed to Codling that minerals in biosolids can linger in soils long after the soils are amended. In addition, the way biosolids are processed before they are applied to soils may affect soil mineral levels to some degree.

“Even though I was evaluating mineral levels in vegetative tissue, not grain, the results still show that food and feed crops can take up minerals left over from biosolids years after the soils have been amended,” Codling says. “Since sewage treatment facilities have different processes for treating biosolids, this information could help us manage biosolid amendments more effectively.”—By [Ann Perry](#), Agricultural Research Service Information Staff.

This research is part of Food Safety, an ARS national program (#108) described at www.nps.ars.usda.gov.

Eton Codling is with the USDA-ARS [Environmental Management and Byproduct Utilization Laboratory](#), 10300 Baltimore Ave., BARC-West, Beltsville, MD 20705-2350; (301) 504-5708.

“The Real Dirt on Biosolids as Soil Amendments” was published in the [January 2013](#) issue of *Agricultural Research* magazine.

Studies show biosolids can boost phosphorus levels for years

Jan. 22, 2013 -- Treated wastewater solids called biosolids are sometimes used by farmers to boost soil nutrient levels. Now research by a U.S. Department of Agriculture (USDA) scientist provides new information about how long those plant nutrients remain after biosolids have been applied to the soil.

This work was conducted by Agricultural Research Service (ARS) Agronomist, Eton Codling, and supports the USDA priority of promoting international food security. ARS is USDA's chief intramural scientific research agency.

Biosolids used in agricultural production have been processed to kill pathogens, and their use is strictly regulated to ensure that the materials don't harm the environment, human health, or animal health. Farmers who follow pre- and post-application management regulations can obtain permits to apply biosolids to fields where food and feed crops are grown.

Codling measured mineral levels in three different soils that had received a single amendment from a biosolid processed either via high heat, additions of lime, anaerobic digestion, or air drying. The amendments, which were applied at several different rates to the soils, had taken place from 16 to 24 years earlier during previous studies on biosolids. As part of the earlier work, the fields had been cropped after the biosolids had been added, so the biosolid nutrients in the experimental fields had been available for crop uptake for at least 16 years before Codling began his research.

Codling observed that phosphorus levels were generally higher in the biosolid-amended soils than in soils that didn't receive the amendments. This strongly indicated that soluble phosphorus levels in biosolid-amended soils could exceed typical plant requirements for years after biosolids were added.

Codling, who works at the ARS Environmental Management and Byproduct Utilization Laboratory in Beltsville, Md., also noted that phosphorus solubility varied with the biosolid type and application level.



Latest News

Web Date: March 18, 2013

Sewage Plants Struggle To Treat Wastewater Produced By Fracking Operations

Environment: Water used in natural gas production may still contain high levels of contaminants, even after going through wastewater treatment plants

By Leigh Krietsch Boerner

When energy companies extract natural gas trapped deep underground, they're left with water containing high levels of pollutants, including benzene and barium. Sometimes the gas producers dispose of this contaminated water by sending it to wastewater treatment plants that deal with sewage and water from other industrial sources. But a new study suggests that the plants can't handle this water's high levels of contaminants: Water flowing out of the plants into the environment still has elevated levels of the chemicals from natural gas production (*Environ. Sci. Technol.*, DOI: [10.1021/es301411q](https://doi.org/10.1021/es301411q)).

In 2010, about 23% of U.S. natural gas production involved a process called hydraulic fracturing or fracking. Workers inject high volumes of water at high pressures into the ground to break shale rock formations and to release trapped natural gas. Up to 80% of that injected water returns to the surface, where it's collected as wastewater.

Currently, companies deal with this leftover water by reusing it, injecting it into deep storage wells, or sending it through sewage treatment plants.

However, in May, 2011, the Pennsylvania Department of Environmental Protection asked that the state's treatment plants voluntarily stop processing fracking wastewater. The request came in response to public concern over elevated bromide levels in the Pennsylvania Monongahela River watershed—an area with facilities that treat water from natural gas production. Scientists hadn't definitively pinpointed fracking waste as the source of this pollution. In general, researchers haven't studied how fracking wastewater affects the quality of water leaving sewage plants.

To learn more, Kyle J. Ferrar, a graduate student at the [University of Pittsburgh](#), and his colleagues analyzed water from treatment facilities that initially processed fracking water and then later complied with the state's recommendation. They took water samples from one private and two public facilities in Pennsylvania that treated water from the nearby Marcellus Shale region, the largest shale basin in the U.S. They collected samples both before and after the department's request.

Using a variety of spectroscopic techniques, the team measured levels of chemicals found in gas production waste but aren't typically present in other industrial wastewaters. Although levels of these chemicals varied widely among the three treatment plants, in general, concentrations dropped significantly after the plants stopped taking the fracking waste, Ferrar says. For example, at a municipal plant in Greene County, average barium concentrations fell from 5.99 to 0.14 mg/L. But when the plants still handled the waste, levels of several of the chemicals exceeded drinking water standards set by the U.S. Environmental Protection Agency. At the Greene County plant, the levels of barium and strontium, two toxic metals found in fracking wastewater, were on average 5.99 and 48.3 mg/L, respectively. EPA drinking water standards for these metals are 2 and 4 mg/L, respectively.

[Carl Kirby](#), a professor of geology at [Bucknell University](#) who studies the environmental impact of Marcellus Shale gas production, says the human health impact of elevated contaminant levels from processed fracking water is unclear, because the water the team sampled is not used directly as drinking water. However, he points out that fracking contaminants eventually could reach larger water systems used for drinking water, albeit at significantly diluted levels.

Ferrar agrees that there is no immediate public health concern over the pollutant levels. But he does worry about how the elevated levels affect aquatic ecosystems receiving water from treatment plants. He hopes researchers will study further the impact of disposing of produced waters via wastewater treatment plants.

Chemical & Engineering News
ISSN 0009-2347

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Delayed EU phosphorus plans coming soon

A delayed strategy to preserve and recycle scarce phosphorus resources will hopefully be coming soon, the European Union's environment commissioner says.

Read more: http://www.upi.com/Business_News/Energy-Resources/2013/03/11/Delayed-EU-phosphorus-plans-coming-soon/UPI-14571362974700/#ixzz2NLV7uUSe

Published: March. 11, 2013 at 12:05 AM

BRUSSELS, March 11 (UPI) -- A delayed strategy to preserve and recycle scarce phosphorus resources will be coming soon, the European Union's environment commissioner says.

European Commissioner for Environment, [Janez Potocnik](#), told the First European Sustainable Phosphorus Conference in Brussels Thursday a long-sought "green paper" on how the European Union proposes to cut waste and inefficiency in the use of the agriculturally vital mineral -- originally set to published last year -- is on its way.

"I hope to present a green paper on the issue in the coming months," Potocnik said.

The assurance came after a published report indicated the phosphorus measure is being held up by a key aide to European Commission President [Jose Manuel Barroso](#).

Potocnik is seeking to establish an EU-wide market for recycled phosphorus as a way to end the endemic over-application of the increasingly expensive mineral fertilizer, which European farmers must now import from North Africa, the Middle East and elsewhere.

"We should aim to have a market across the EU for the different forms of recycled phosphorus," he said. "We should aim for precision farming techniques to become

standard across many different types of agriculture. We should aim to be using much more of this resource that is available to us in the EU."

But sources told the British environmental news website ENDS Europe that commission Secretary-General Catherine Day is pressuring Potocnik to delay the green paper, which would serve as a starting point for policy formulations.

The disagreement reportedly centers on Day's belief that the commission's work should be focused solely on economic growth and the eurozone crisis.

"The focus is on the economy and jobs. Other things can wait," the source said.

Under the commission's governance system, the secretary-general can effectively block proposals from any of its branches by preventing them from being put to broader consultation, the website reported.

Potocnik has an ally in the Netherlands, which is pressing for the immediate publication of the phosphorous green paper.

Dutch agricultural planners have taken measures to "close the phosphate cycle," in which they have invested in recovering phosphate from sewage, sludge and municipal organic waste and manure to be processed into products such as fertilizers and soil improvers substitutes.

The result, they say, is less waste, less use of fertilizer and cleaner surface water.

Worldwide demand for phosphorus is quickly rising but its production is limited to handful of countries, including Morocco, the United States, China and Russia.

The European Union imports nearly all of its raw phosphorus materials and has almost no reserves, while the United States used up nearly all its reserves and has stopped exporting phosphate rock, and China has

effectively stopped export by introducing a 200 percent export tax.

As a result, Europe is to a large extent dependent on phosphorus from Morocco.

The fertilizer also causes environmental problems because of its inefficient use -- only a one-fifth of the 16 million tons of phosphorus is used for human nutrition while most runs off into rivers, lakes and oceans.

There it triggers the growth of algae, which depletes oxygen supplies needed by fish and other forms of aquatic life.

Calendar of Events

MBT Meetings

May 16, 2013,
Grandville Clean Water Plant, Grandville

July 18, 2013,
MSU Ag Expo, East Lansing

September 19, 2013
Johnson Wildlife Center, Cadillac

December 12, 2013
Bavarian Inn, Frankenmuth (Holiday Party)

MSU Agricultural Exposition

Michigan State University
July 16-18, 2013

