3/6/2019

TCEQ Environmental Complaints
P.O. Box 13087
Austin, Texas 78711-3087

Texas Commission on Environmental Quality (TCEQ) COMPLAINT:

07/2014 observed and photographed Trinity River Authority broadcasting toxic sewage sludge “biosolids” at Latitude.32.42643 by Longitude 96.89738 inside Waxahachie City limits. Contacted City and County officials 7-2014.

Property bought by WISD 5/1/2015

12-2016 start of construction Waxahachie High School at Latitude.32.42643 by Longitude 96.89738.

Source of 11,473.36 tons of sewage contamination: The Trinity River Authority
Central Regional Wastewater System
6500 W. Singleton Blvd.,
Dallas, Texas 75212

TCEQ,

Waxahachie High School, in Ellis County (WHS), TX, built on 11,474.36 TONS of Trinity River Authority (TRA) (the Generator) toxic industrial, medical, storm and household sewage sludge called biosolids. At the time of broadcast, sewage sludge was classified Class A but was changed several months later to Class AB.
47.03 TONS per acre at GPS Latitude 32.42643 by Longitude 96.89738. Broadcasted by TRA’s agent, Renda Environmental, between 2011-2015.
Site Address: 3001 US Hwy. 287 Bypass, Waxahachie, TX 75167. School occupied as of 8/2018.

Waxahachie High School is the first documented case of its kind, in Texas, to be subjected to this type of exposure to thousands of chemicals by our Ellis County Citizens. Tens of thousands over time will be exposed. I can find no other incident where a school has been built on, wrapped in and surrounded by industrial, medical, storm, and household sewage sludge of any class of biosolids. The contractor excavated surface contaminated biosolids, made a large pile and after the school’s completion, “wrapped” the school in existing biosolids for landscaping. TAC 30 regulations state that biosolids may not be put within “750 feet from an established school”. TAC 322.44(c)(2)(D) Management practices “biosolids buffer zones (D) 750 feet, established school, institution, business, or occupied residential structure;” TAC 30 regulations do not require full disclosure to a buyer concerning contaminated property by sewage sludge biosolids with industrial, medical, storm and household sewage sludge. Class A Class AB and Class B all have the same “other contaminants”.

Hazardous and acutely hazardous chemicals, many of which are carcinogenic, are on the WHS site putting the health of literally thousands of Texas’ youngest citizens at risk of exposure daily. Not only are over 2,000 students exposed per day, but so are all the men and women who have devoted their lives to educating them, plus administrators, security officers, parents and the many good people from the community who visit the campus daily.

This doesn't even begin to talk about exposure to those who are most vulnerable - our athletes, coaches and visiting players and their families.

These hazardous conditions occur daily, but think about what happens when it rains? When you step on saturated ground which makes a vacuum whereby the soil, in this case industrial, medical, storm and household chemicals in biosolids, ooze up through the grass and get on students shoes and clothing. What happens when they fall and get scrapes while the fields are wet? Those carcinogens are ingested and/or getting into their bloodstream. Our children, with their whole lives ahead of them, are not just playing in fecal matter, but other unmonitored, unregulated hazardous chemicals. What do you think parents would say if they knew the stains, they are washing out of clothing, isn't just dirt but chemical carcinogens? How much exposure to carcinogens does it take to cause cancer, chronic diseases and birth defects?
Texas and the Texas Commission on Environmental Quality will have to deal with these contaminated sites cases because they allowed toxic sewage sludge dumps inside Waxahachie City limits and other city limits and have no real regulations to deal with a school built on sewage sludge. Since exposure is occurring as you read this, waiting a year to act is irresponsible and negligent which will make Texas more liable than they already are. This is not one farmer on a tractor in a field of biosolids.

The Trinity River Authority should be held accountable for dumping sewage sludge inside city limits, knowing the property was contaminated and allowing Waxahachie officials to build on it without any notice of its contamination. There is NO accountability for placement of biosolids by the TCEQ inside city limits. There are no regulations or laws that would make a seller disclose applications of toxic biosolids on property sold in Texas. Thus, endangering many Texans' health by exposure via personal contact, dust, and runoff water by chemical carcinogens found in sewage sludge biosolids on property they think is "safe".

The United State EPA's 2009 Targeted National Survey of Sewage Sludge (TNSSS) developed in 2007-8 which tested one of Ellis County's Wastewater Treatment Plants (WWTP) shows large averages of chemicals in biosolids of an estimated 85,000 found in commerce. Only a fraction is tested and regulated.
National TSCA Chemical Substance inventory: (https://www.epa.gov/tsca-inventory/about-tsca-chemical-substance-inventory)
This estimate does not consider compound chemicals.

The United States EPA's Office of Inspector General (OIG) report no 14-P-0363 / 9-2014: "More Action Is Needed to Protect Water Resources from Unmonitored Hazardous Chemicals" . David Galindo, TCEQ Director Water Quality Division, stated approximately January of 2016. "T*CEQ would be required to implement any changes to the existing federal biosolids regulations, including any potential EPA rule amendments in response to the OIG report (14-P-0363). We are unaware of any EPA response addressing the validity of the statements made in the report or determination on the need for a rule amendment at this time."*
This is an indicator that "Unmonitored Hazardous Chemicals" do exist in biosolids dumped on the grounds of what is now Waxahachie High School in Ellis County, Texas. The U.S. EPA and TCEQ have not acted to protect Texas from these "Unmonitored Hazardous Chemicals"

OIG report just released on 11/15/2018 states: "EPA Unable to Assess the Impact of Hundreds of Unregulated Pollutants in Land-Applied Biosolids on Human Health and the Environment." The OIG "analysis determined that 352 pollutants include 61 designated as acutely hazardous, hazardous or priority pollutant in other programs"

Which again indicates that biosolids broadcasted now and in the past were dumped without any testing or regulations for these chemicals nor was there any testing for concentrations and degree of hazard when broadcasted on farms and ranchland. One location that received these Unregulated Pollutants is the acreage as indicated in the GPS coordinates above, Waxahachie High School.

The TCEQ can act without the EPA's approval if their actions are greater not the lessor of a federal regulation. 14-P-0363 speaks to industrial pretreatment and how it has not been effective nor can it until unregulated, unmonitored chemicals are listed and regulated by the United States EPA. The U.S. EPA's priority pollutants list last update was 1981.

It is time for the TCEQ and our Texas Legislature to step up and protect every Texan and our Environment.
This is the TCEQ's mission statement "*The Texas Commission on Environmental Quality strives to protect our state's public health and natural resources consistent with sustainable economic development. Our goal is clean air, clean water, and the* ***safe management of waste."***

Sewage sludge biosolids, by its nature, coming from industry, medical facilities, surface storm drains and homes are NOT "safe". Continually distributing contamination on Texas surface land is an insult and health hazard to our citizens and our great State. Sewage of any kind should be incinerated or placed in a lined landfill where it belongs. Money should not be a priority for where sewage sludge is dumped nor should a lack of landfill space, especially in Texas. This also includes allowing consumer bags of this contamination sold to rid municipalities' responsibility of sewage disposal. (Hou-Actinite, Milorganite and Dillo Dirt for examples).

Ellis County Citizens insist, for the safety of our school, Texas and TCEQ do a quantitative analysis of this site for the usual chemicals tested for plus the "61 designated acutely hazardous, hazardous or priority pollutants in other programs." (19-P-0002 list below in Exhibit A1)

The method of sampling should be as follows:
Test 4 DIFFERENT locations in the adjacent field, 4 DIFFERENT locations around the school and 3 DIFFERENT LOCATIONS on the athletic fields at a depth to be determined.

With verification of chemical contamination of this site, proper remediation such as 30 to 40 inches of contaminated soil excavated and taken away from next to the school to well beyond the 750 feet from the school as indicated in TAC 322.44(c)(2)(D). The contaminated soils removed and properly disposed of so it cannot endanger the health of any more Texans.

Sincerely,

Craig Monk
Waxahachie, Texas 75167

WHS under construction. Contractor piled up contaminated biosolids soil to landscaped school grounds with.

Load sheet on WHS site Lat 32.42643 Lon: 96.89738. We have removed the farmers name. Should you wish a copy of this load document, contact TCEQ public records. Farmers are not informed of "other" chemical amounts, concentrations and degree of hazard before agreeing to use biosolids. The TCEQ has verbally stated biosolids are "safe".

RENDA Environmental, Inc.
2501 Greenbelt Road
Ft. Worth, TX 76118
(817) 571-9391

RENDA ENVIRONMENTAL

Cumulative Multiproduct Site Report

Generated 9/17/2015 at 2:17 PM
8/1/2014 thru 7/31/2015

Contact | **Phone** 3

Address

Field Name ECDC15 | **Acres** 244.000

Latitude 32 42643 | **Longitude** 96 89738

Source	**Wet Tons**	**Solids**	**Dry Tons**
TRA A PLATE & FRAME	268.00	37.92	101.62
TRA A3 BELT PRESS	2431.28	30 07	731.06

Cumulative Additions

	Total Dry Tons	**Dry Tons Per Acre**
Interval	832.68	3.41
Fiscal Year	832.68	3.41
Lifetime	11474 36	47.03

Pounds Per Acre

	Interval	**Fiscal YTD**	**Lifetime**
Arsenic	0 057	0.057	0.869
Cadmium	0 003	0 003	0.183
Chromium	0 166	0 166	2.091
Copper	2.411	2.411	24.792
Lead	0.068	0.068	1.241
Mercury	0.002	0.002	0.032
Molybdenum	0.090	0.090	1.258
NH4-N	1.633	1.633	28.487
Nickel	0.130	0.130	2.172
NO3-N	0.965	0.965	3.603
Phosphorus	69 720	69.720	1004.332
Potassium	5.278	5 278	88.799
Selenium	0.023	0.023	0.257
TKN	200 311	200 311	2788.486
Zinc	2.234	2 234	26.348
	8/1/2014 thru 7/31/2015	8/1/2014 thru 7/31/2015	9/28/2006 thru 7/31/2015

(n/a = No lab data entered for this source in that period)
(0 000 means no detect)

School with inset picture of the TRA broadcasting sewage contamination.

Exhibit A1

List of unassessed pollutants found in biosolids that appear on a hazardous or priority pollutant list

Pollutant
2,3,7,8 TETRACHLORODIBENZO-P-DIOXIN
2-Propanone
Antimony
Benz(a)anthracene
Benzo(a)pyrene
Benzo(b)fluoranthene
Benzo(k)fluoranthene
Beryllium
Bis (2-ethylhexyl) phthalate
Carbamazepine
Carbon tetrachloride
Chloroaniline, 4-
Chloroform
Chloronaphthalene, 2-
Cresol, p- (4-methylphenol)
Chrysene
Cyanide
Cyclophosphamide
Dichlorobenzene, 1,3-
Dichlorobenzene, 1,4-
Dimethoate
Dimethyl phthalate
Di-n-butyl phthalate (Butoxyphosphate ethanol, 2-)
Di-n-octyl phthalate
Endosulfan, α
Endosulfan, β
Estradiol, 17α-
Estradiol, 17β-
Estradiol-3-benzoate, β-
Estriol (estradiol)
Estrone
Ethylbenzene
Ethynyl estradiol, 17α-
Fluoranthene
Heptachlor epoxide
Mestranol
Methylene Chloride
Napthalene
Nitrophenol, p-
N-nitrosodibutylamine (NDBA) 924-16-3
N-nitrosodiethylamine (NDEA) 55-18-5
N-nitrosodimethylamine (NDMA) 62-75-9
N-nitroso-di-n-propylamine (NDPA) 621-64-7
N-nitrosodiphenylamine (NDPhA) 86-30-6
N-nitrosopiperidine (NPIP) 100-75-4
N-nitrosopyrrolidine (NPYR) 930-55-2
Norethindrone (norethisterone)
Norgestimate
Norgestrel (levonorgestrel)
Pentachloronitrobenzene
Phenanthrene
Progesterone
Pyrene
Silver
Sodium valproate
Testosterone
Tetrachloroethylene
Thallium
Toluene
Trichlorophenol, 2,4,5-
Warfarin

References

Biosludged, https://www.brighteon.com/5972782789001

Dr David Lewis on the dangers of pollution by "biosolid" https://www.youtube.com/watch?v=uzfNSw9xG-c&feature=youtu.be

OIG Report 19-P-0002 / **EPA Unable to Assess the Impact of Hundreds of Unregulated Pollutants in Land-Applied Biosolids on Human Health and the Environment**: https://www.epa.gov/office-inspector-general/report-epa-unable-assess-impact-hundreds-unregulated-pollutants-land

OIG Report 14-P-0363 / **More Action Is Needed to Protect Water Resources From Unmonitored Hazardous Chemicals:** **https://www.epa.gov/sites/production/files/2015-09/documents/20140929-14-p-0363.pdf**

The US is the only developed country on a list of nations with the highest pollution-related deaths — here are the top 10: https://www.businessinsider.com/ap-countries-with-the-highest-pollution-deaths-mortality-rates-2017-10/#10-democratic-republic-of-the-congo-123942-18-of-all-deaths-1

Unsafe levels of toxic chemicals found in drinking water of 33 states: https://news.harvard.edu/gazette/story/2016/08/unsafe-levels-of-toxic-chemicals-found-in-drinking-water-of-33-states/

United States EPA's Office of Inspector General reports: 2000-P-1, 2004-P-10, 2004-P-00004, 10-P-0066 or 12-P-0508.

85,000 chemicals, TSCA Chemical Substance Inventory: https://www.epa.gov/tsca-inventory/about-tsca-chemical-substance-inventory

U.S. EPA definiotion of pollutant: Part 503.9(t) "POLLUTANT is an organic substance, an inorganic substance, a combination of organic and inorganic substances, or a pathogenic organism that, after discharge and upon exposure, ingestion, inhalation, or assimilation into an organism either directly from the environment or indirectly by ingestion through the food chain, could, on the basis of information available to the Administrator of EPA, cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions(including malfunction in reproduction), or physical deformations in either organisms or offspring of the organisms."

Expert Testimony

Author Lidia Epp at PA House
Democratic Committee Hearing / 08/29/2016
About Lidia Epp:
Lidia Epp, a Polish native, immigrated to the United States in the mid 1980s. She is a graduate of University of Szczecin, where she received her Bachelor Degree in Biology and Master's in Marine Biology. Before emigrating to US she was employed as a marine biologist at the Marine Fisheries Institute in Poland. Upon arrival to US, for several years she worked as a marine biologist in an aquaculture pathology lab at Gulf Coast Research Laboratory in Ocean Springs, Mississippi. She later moved to Birmingham, Alabama, and eventually to New Kent, Virginia where she currently resides. She worked at the Molecular Diagnostics Laboratory at the Medical College of Virginia and currently she manages the Molecular Core Lab in the Biology Department of College of William and Mary in Williamsburg. Lidia is active with a local group of residents concerned about the agricultural application of biosolids, a dangerous practice that devastates farmland. She voiced her opposition during state legislative sessions, public hearings and City Hall meetings. She corroborates with local activists, politicians and scientists to bring public awareness to this issue and advocates for changes in state and federal regulations of biosolids land use.
TIMELINE:
It all started in 1972 with the passing of Marine Protection, Research and Sanctuaries Act. It is the only pollution law that explicitly requires consideration of land-based alternative disposal.
1972 was also the year that Congress passed the Clean Water Act, with major revisions in 1977, 1981 and 1987. Last revisions, in 1987, resulted in amendments directing the EPA to research and promulgate the land applications of sewage sludge. A year later in 1988, Congress passed the Ocean Dumping Ban Act, thus eliminating all but land disposal method of sludge.
The Act went into effect in 1992, also the year when the PR firm was hired by the industry to devise a plan for gaining public acceptance of sewage sludge land disposal. And so the names “biosolids,” “industrial residuals,” “natural fertilizer,” and “organic nutrients” were invented.
EPA quietly removed the sewage sludge from the list of HAZMAT and in 1993, sewage sludge federal regulations were published in the Federal Register as the “Part 503 rule,” promulgated under the authority on the Clean Water Act, Title 40 of the Code of Federal Regulations, Part 503.
In 1986, Synagro Technologies Inc. was founded, a company currently operating in 34 states, specializing in agricultural disposal of sewage sludge and industrial waste. Or, to be politically correct, “biosolids and industrial residuals management.”
**EPA REGULATIONS FAILURE
The Part 503 rule is a set of federal guidelines for the oversight and monitoring of agricultural use of sludge. The science behind those rules is grossly outdated, based on 1970 understanding of environmental sciences, biology, toxicology and pathology.
The futility of these EPA guidelines to protect public health lays not only in the fact that the regulations include a very narrow scope of pollutants required to be monitored (just nine heavy metals and only two species of bacteria), but they also don’t reflect recent scientific findings. They regulate an infinitely small fraction of environmental pollutants, while ignoring a vast majority of dangerous components of sludge.
EPA regulations fail to incorporate existing scientific information and to protect the public. While numerous scientific experts recommend total ban on land application of sludge, EPA and the so-called Big Sludge industry continues to promote it. Sludge land application is a result of local and state economics and political factors, rather than the environmental and public health considerations. Sludge continues to be sold to the

public as a “nutrient –rich garden compost” and advertised to farmers as a valuable fertilizer.

A total ban of agricultural use of sludge is only a partial solution as the alternatives such as landfill or incineration are also hazardous. To ensure the true protection of the environment and public health would require the EPA to reformulate the problem, to implement new federal regulations based on the most current science. However, EPA along with other federal, state and private institutions, such as USDA, universities and waste management companies (most prominently – Synagro) - continues to obstruct an unbiased, independent research and this in turn undermines an objective risk assessment and regulation.

**ENVIRONMENT AND PUBLIC HEALTH RISKS

Targeted National Sewage Sludge Survey Sampling and Analysis Technical Report, published in 2009 by EPA lists max an min levels of heavy metals , pharmaceuticals, organic chemicals, steroids and hormones that were found in sludge samples tested. High levels were found in all pollutant categories, for example – flame retardants and antibiotics. The survey included only a small subset of the toxic chemicals in use in the country.

Tens of thousands of organic chemicals are in use in USA, but a sludge concentration of only 516 organic chemicals has been so far researched. The data is lacking on fate and toxicity of chemicals to human and non-human receptors. An accurate assessment of a degree of the risk posed by the sludge is not possible at this moment. It is however, abundantly clear from the research available, that the EPA risk assessment is geared towards the underestimation of those risks. Science–based precautionary approach to investigating and identifying the toxic content of sludge should be the guiding principle of EPA federal regulatory review.

The complexity of the ecological interactions in sludge applied soils makes it exceedingly difficult for a definitive risk assessment. There are just so many interactions, unknowns and uncertainties, that the application of sludge to the land environment simply can’t be considered safe. Accurate risk assessment would require an in-depth understanding of a long and short-time effects of sludge on soil microbial community, plant life and wildlife. And then there is the issue of public health risks. There is a great need for better understanding of a build-up of the toxins and contaminants over time with multiple applications and their movement from land environment into the groundwater, lakes, rivers and oceans. Long term, multidisciplinary, comprehensive research programs are needed to gain an understanding of the impact this practice has on the environment and human population.

New chemicals are invented almost daily. EPA formulated the 503 rule guidelines well before several of them were even conceived.

Let’s look at nanosilver, which is a biocide (EPA definition: “a diverse group of poisonous substances including preservatives, insecticides, disinfectants, and pesticides used for the control of organisms that are harmful to human or animal health or that cause damage to natural or manufactured products").

Nanosilver is a component of anti-microbial formulations in textiles, food packaging and medical devices . Coleman et al in 2013 published an article: “Low concentration of Silver Nanoparticles in Biosolids Cause Adverse Ecosystem Responses Under Realistic Field Scenario”. In this article the author argues that nanosilver applied at realistic levels to the soil by the biosolids route adversely affects plants and soil microbes. Another example; a group of persistent, bioaccumulative, toxic compounds known to exist in the sludge in high concentration: brominated flame retardants. A subclass of those – polybrominated diphenyl ethers (PBDEs) –there is 208 different PBDEs, each of them has unique toxicology and environmental fate. This group of chemicals has been

studied extensively for decades and still today we have a rather poor understanding of the true risks associated with it's release to the environment. And that's just one group of contaminants among so many. Add another 210 chlorinated dioxins (we are still talking about only flame retardants) and you maybe begin to grasp the extend of the total amount of known and unknown contaminants that end up in the sludge. They are concentrated thousands folds during the treatment process and then released to the landscape.
Marine biochemist, (PhD)Robert Hale from Virginia Institute of Marine Sciences, in his 2004 publication: "Organic Contaminants of Emerging Concern in Land Applied Sewage Sludge" concludes that contaminants not even considered by the authors of rule 503 EPA regulations are indeed present in all of the biosolids samples examined during this study and he strongly suggests reevaluation of those guidelines in the light of those findings. Not only the "historically" tracked contaminants like heavy metals, petroleum products , pesticides and PCB were present in those samples, but also chemicals that were never evaluated before as a potentially present in the sludge; polybrominated diphenyl ethers, triclosan and polycyclic musks. Those are contaminants of yet undetermined level of toxicity to humans, wildlife and microbial soil community.
There is little doubt that there are direct human health consequences of land application of sludge. Several published public health reports clearly link the sludge application sites to the overall decline of health by the surrounding communities.

Czajkowski et al in a publication from 2010 "Application of GIS in Evaluating the Potential Impacts of Land application of Biosolids on Human Health" concludes that there is a statistically significant increase in ill-health symptoms and diseases near the biosolids permitted fields. Exposed residents were defined as those living within the one-mile radius of filed applied biosolids, the illnesses included certain respiratory, gastrointestinal and other diseases.
Jordan Peccia, one of the most prominent scientific minds in environmental toxicology, a professor at Yale University, published several articles addressing risks associated with biosolids agricultural use. In 2007 he coauthored a study "Source Tracking Aerosols Released from Land-Applied Class B Biosolids During High-Wind Events". In that publication he concluded that during windy days over 60% of air samples taken downwind from the biosolids applied field contained DNA fingerprint of bacteria commonly present in sludge. What bacteria, you might ask? A pathogen or a benign microbes common everywhere around us? Dr Peccia tackled that question in 2010 publication titled "Pyrosequencing of the 16SrRNA gene to Reveal Bacterial Pathogen Diversity in Biosolids". In this article he concluded that most species identified were opportunistic pathogens from the group Clostridium and Mycobacterium. Those are NOT the two species of bacteria The EPA rule 503 regulations that are required to monitored, yet as proven in this study – represent most of the bacterial pathogen load in biosolids.
In a Master's Degree dissertation – "Bioaerosols Generated from Biosolids Applied Farm Fields" a graduate student from Ohio Tech established that pathogenically non-treated class B biosolids can generate potential pathogens in the air. He observed that the level of bacterial pathogens significantly increased in the air samples following the biosolids application with the highest level reached at day 13 post application. That in turn correlates with the increase of health problems reported by the residents of a nearby community.
There are many other published reports corroborating those findings, but more epidemiological data is needed. EPA should be at the forefront of promoting and

subsidizing such studies, instead it turns the blind eye on a growing body of evidence and instead promotes research sponsored by the sludge industry.

Another area of great concern associated with the biosolids production is the emergence of antibiotic-resistant pathogens. The evolution of multidrug resistant bacteria is and acknowledged international health crisis. Major sources of those bacterial strains are water treatment plants and CAFO facilities.

Wastewater treatment plants concentrate sludge and present in it; both – bacterial pathogens from numerous sources and antibiotics, thus creating a perfect storm scenario for the emergence of antibiotic resistant strains by the means of horizontal gene transfer of antibiotic resistance genes.

**CONCLUSIONS

Current federal and state regulations clearly don't protect the environment or public health from the consequences of the agricultural sludge application. The full scope of that impact is not even fully known, as the independent, objective research is being discouraged at best, and most often squelched by the powerful forces of biosolids industry.

It is evident that the long term exposure to a host of the environmental pollutants is the foundation of many chronic conditions that are now at the epidemic levels. Rather than focusing narrowly on determination of specific sets of toxins present in biosolids from different sources – the research needs to shift to the epidemiological studies assessing the overall impact of complex mix of pollutants present in sludge.

It is true that biosolids contain beneficial elements like phosphorus, nitrogen, organic matter and trace nutrients. But the benefits derived from introducing those components to the soil via biosolids are by far overshadowed by the detrimental effects of toxins and pollutants that comprise the vast majority of the biosolids content.

Many countries adopted and implemented a new approach to the disposal of biosolids; methane production, energy source, recovery of metals and microelements. It is well past the time when we start to look at those alternatives as the only sustainable solution to the growing problem – what to do with the sludge our society produces.

** From: Caroline Snyder Date: August 29, 2016 My name is Caroline Snyder. I am emeritus professor at the Rochester Institute of Technology where I designed, administered, and taught interdisciplinary environmental science courses and chaired the Department of Science, Technology, and Society. In 2001 I founded the nonprofit group, Citizens for Sludge-Free Land. I appreciate the opportunity to submit written testimony at this public hearing.

A re-evaluation of the Commonwealth's biosolids policies is long overdue. HR 60 is a good first step. Land-applied municipal sewage sludge (biosolids) is a highly complex and unpredictable mixture of biological and chemical pollutants. Most of the 90,000 man-made chemical compounds in commerce today--with 1000 new ones added annually-- end up in sewage, and many of those concentrate in the resulting biosolids . 107 They include carcinogens, mutagens, neurotoxins, endocrine disrupters, solvents, pharmaceuticals, radioactive waste, leachates from landfills and superfund sites, as well as disease causing and antibiotic resistant pathogens. 52,61,66,79,87, 97,104, Upgrading and building improved treatment plants that will remove more pollutants from sewage, will cause sludge to become even more contaminated. Biosolids generated in our large industrialized urban centers -- and 84% of land- applied sludge originates in those centers-- is very likely the most pollutant- rich waste mixture of the 21st century.   The US EPA Office of Water (OW) regulates biosolids. The regulations, 40 CFR Part 503, are usually referred to as the 503s. Despite the agency's claim to the contrary, OW also promotes land application.   This is a gross conflict of interest. Government agencies should not be in bed with the industries they are supposed to regulate. 82 As a consequence of this industry-government alliance, the 503s are full of loopholes. The most damaging loophole of all is the so-called "Domestic Sewage Exclusion" which permits every industry connected to a sewer to pipe its hazardous waste into POTWs. A partial list of those pollutants is posted on our web page. 106   When these hazardous chemicals are mixed with sewage, they become exempt from RCRA's solid and hazardous waste laws. Industries and municipalities benefit from the Domestic Sewage Exclusion in several ways: they can avoid the expense of properly treating pollutants or refrain from piping hazardous waste into POTWs in the first place; and once these two waste streams mix, industries are no longer liable for any damages that might result from this toxic mixture., especially when it is processed and land applied. In an unpublished and undated document, titled Gatekeepers: W 2 You may have missed the proposed rulemaking to change the reporting requirements for lead as a "persistent and bioaccumulative toxic." The proposal would reduce from 10,000 to 10 the number of pounds annually that an entity can dispose without reporting, and the de minimis lead concentration for reporting would be eliminated. At first reading, it seemed to me that this reporting rule would capture most of Philadelphia's recycling programs. But apparently all other POTWs and we are saved by the fact that the rule doesn't apply to POTWs . This is one case where being a POTW making a fertilizer is preferred to being a manufacture [sic] making a fertilizer; we are in the right SIC code. But this is cold comfort. Some folks in Congress, in the environmental community and in EPA itself believe it is in the public's and environment's best interest to track the lead that is spread on land. Someday they will get us, and we need to be prepared. Fighting changes to the Domestic Sewage Exclusion may haunt us as an example to the environmental community that our claim to being concerned for the environment is a sham. After ocean dumping was banned, land application increased, as did the reports of serious health, livestock, and environmental damage. The first comprehensive scientific appraisal of the 503s was published in 1999 by internationally renowned soil scientists at the Cornell Waste Management Institute (CWMI) —whose teams have been researching biosolids since the 1970s. Aptly titled The Case For Caution the report warns that the 503s do not protect human health, agriculture, or the environment. 23   Around the same time a team assembled by David Lewis-- formerly a senior level EPA research microbiologist-- documented human and animal sicknesses and deaths linked to land application under the 503 rule, the first scientist to do so. 35,36,37,84 Because of increasing concerns about health impacts, the National Academy of Sciences (NAS) was asked to examine the scientific basis of the 503s. Its 2002 report, Biosolids Applied to Land, questioned the science and risk assessment models of the rule and urged EPA to implement health studies of neighbors who lived adjacent to sites that had been treated with sludge.   NAS panel members had available not only the work of Lewis' team and that of the CWMI, but also a 382 page document put together by sludge activist Helane Shields listing sludge "incidents" that had occurred in virtually every state of the union. 54 Particularly worrisome were the many reports of sicknesses and several deaths. 90 To include published papers that documented these incidents in the scientific literature would hurt the land application program. So industry-friendly NAS panel members deleted all references to David Lewis' papers in the published report, which includes the statement that there is "no documented evidence" that anyone was ever harmed by sludge. In the absence of any credible science that supports land application, industry and government agencies continue to cite the "no documented evidence" claim, making sure the evidence is not documented, or, if it is, to ignore or discredit it. 92 Yet people are not easily fooled. Every week there are reports of sludge battles, especially in the heavily populated areas of the country where most sludge is produced and spread. Residents who believe they have been or will be harmed are pitted against government and industry officials who assure them that the practice is beneficial and safe. For example during a 2014 Town Meeting in Bell County Township, Clearfield County PA angry residents demanded an end to sludge spreading in their community because it was making some of them sick. Despite the usual misleading assurances by state officials that biosolids will enrich the soil and improve the overall health of land and animals, residents wanted the 3 practice stopped. One neighbor who lives close to the permitted site was hospitalized with bronchial spasms when the spreading began. Her doctor said that such spasms, which resemble a heart attack, can be caused by airborne irritants. Other people attending the meeting complained of headaches and nausea. 96 Government and industry representatives at these meetings usually assure affected residents that their health problems or their contaminated wells were caused by something else. For example, a few years ago, when an astute NH property owner learned that his neighbor uphill was about to use sludge, he decided to have his well water tested before and after the spreading. Not surprisingly, test results taken after the application showed high levels of pathogenic bacteria. After he complained a representative of the sludge company visited his home, looked around, and stated that the well must have become contaminated by his bird feeder! However, when deaths are linked to sludge exposure, bird feeder explanations do no longer work. Two of those deaths occurred right here in the Commonwealth.

The PA DEP and the company that spread the sludge went through extraordinary lengths to cover up the cause of these deaths. For a summary see Appendix A. Evidence keeps piling up that there is something seriously wrong with the 503s. Why, many people ask, are EPA and USDA--agencies whose mission it is to protect human health, promote sustainable and productive agriculture, and protect the environment—why are these agencies not substantially tightening the current land application rules, or better yet, why are they continuing to spend our tax dollars on a million- dollar Public Acceptance Campaign, when, instead, they should be using those funds to invest in safer and more sustainable alternatives? One part of the answer is simple. Top managers at EPA's Office of Water and a highly influential agronomist at the USDA wrote the 503s. They decided that it would be acceptable for biosolids to contain hazardous waste, reasoning that small amounts do not matter, that the waste stream is getting cleaner, and that pretreatment of industrial waste is working. None of those assumptions proved to be true. Even very small amounts—parts per trillion-- of some pollutants can harm developing organisms, and instead of getting cleaner, the waste stream is getting more complex and more polluted. Several recent EPA Inspector General Reports, indicate that hundreds of priority pollutants discharged by industry are showing up in effluent and sludge. But the individuals who wrote the rules are still in charge of the nation's biosolids policy and have staked their reputation on the adequacy of the 503s.

Apparently no amount of evidence will persuade them that they were wrong. 92 The other part of the answer is also simple. Not only the sludge brokers who are paid for every ton of sludge they remove from sewage treatment plants, but also --as we explained earlier-- industrial users and municipalities save substantial sums by continuing this inexpensive method of sludge disposal.

Communities are learning more about what biosolids are, and what they do when land applied. They are experiencing first-hand the resulting harm to their health, 51,55,68,71,108,109 their drinking water, 12,71,77,99,101 and their animals. 74,79,83,94,105 To counter this new awareness, government agencies and the sludge industry are spending millions to rev up their PR campaign to convince farmers, the media, 4 legislators, and the public that spreading this incredibly complex contaminated mixture on land is sustainable., beneficial and safe. A key flaw of the 503s is that they depend on Quantitative Chemical-by-Chemical Risk Assessment (QRA) to assess health and environmental impacts. QRA works for calculating how strong a bridge must be to withstand the weight of daily traffic on a particular highway, but QRA cannot be used to assess the health and environmental impacts of such a complex and unpredictable mixture as land applied sewage sludge. See Appendix B Instead of calculating health and environmental risks using QRA models, the NAS panel recommended a different approach: Even if a summary index of an adverse response to mixtures was available, it would not necessarily reflect the total hazards of exposure to biosolids because of the inability to identify all of its hazardous constituents and their potential for interaction in vivo . . . thus it is not possible to conduct a risk assessment for biosolids at this time (or perhaps ever) that will lead to risk-management strategies that will provide adequate health protection without some form of ongoing monitoring and surveillance . . . the degree of uncertainty requires some form of active health and environmental tracking." A number of the biosolids incidents might have been prevented had there been exposure studies and health and environmental tracking. Many serious health impacts have been linked to Class B sludge exposure, especially when this material is stockpiled and top dressed rather than incorporated into the soil. Sludge advocates are now promoting a material that is deceptively referred to as Exceptional Quality (EQ) Class A sludge. Many people do not realize that Class A EQ sludge contains just as many persistent toxic chemicals as Class B. When sludge is further processed to reduce indicator pathogens, it turns into Class A. However, as the more vulnerable indicators are deactivated, much more robust pathogens survive and evolve. In the absence of microbial competition, they multiply and thrive, especially in in cool and moist climates. Some of the treatment methods prescribed to reduce the level of indicators are not working, so Class A sludge is often Class B sludge or turns into Class B sludge after it is spread or stockpiled.

Further processing also appears to encourage the growth of superbugs which explains why many neighbors exposed to sludge contract MRSA infections. The question arises, why, if all of this is true, are industry and government agencies encouraging the production and use of Class A materials? Again, the answer is simple. Under the current rules, Class A is virtually unregulated. As long as it contains some nitrogen, it can be spread anywhere—including on home vegetable gardens--during any weather, at any time during the year, in any amounts, and does not require public notices, public hearings, or the expense of getting a permit. Also Class A products can be sold in garden centers, often misleadingly labeled. But are they really safe? Consider two incidents. One took place in the summer of 2007 in Milwaukee, where sludge is used to make the Class A product Milorganite. Sewer workers dislodged large amounts of PCBs during a routine sewer cleaning operation. This resulted in thousands of tons of contaminated sludge-- some containing superfund high levels of PCBs—to be spread on dozens of school playgrounds and parks. When the problem finally w 5 material had to be removed and shipped to out-of-state hazardous waste landfills. The entire incident cost the city millions. 104 Consider another incident that happened in Shirley MA . In January, 2014 a farmer spread Earthlife on his frozen snow-covered field. Earthlife is a Class A product made by Casella Organics and fully approved and registered for use in MA, CT, and VT. Three weeks later, after a thaw, residents living next to the field on 15 and 20 Bumpus Road turned on their faucets and out came diluted sewage. Both families got their water from shallow wells. Earthlife apparently had leached into the water table and contaminated their wells. I was invited to attend a February 28 meeting of concerned neighbors and provided information and hand-outs. Appealing to the town for help was useless because what the farmer had done was legal under the 503s. Despite conclusive test results that the contamination was caused by Earthlife, the homeowners could not afford litigation. A month went by and I did not hear from the affected homeowners. So I contacted them to see how they were doing. During that interval Casella had paid for drilling a bedrock well at one home and had paid for a filtration system for the other family. In return, the homeowners were put on a gag order and told never to discuss the case or share test results. Settlements like these explain why many sludge incidents remain unknown or are underreported. The practice cannot be banned overnight. Something needs to be done with the millions of tons of sludge produced every year. Until more sustainable waste-to-energy technologies are in place to handle this volume, states might want to encourage increasing disposal in well sited subtitle 2 landfills with methane capture for energy and heat. Reclamation of contaminated land may also be an option as long as the site is securely fenced and signed, to prevent another Tony Behun tragedy. It is absolutely crucial that we preserve our dwindling productive farmland for future generations. We must not apply sewage sludge and other industrial waste on the land where we grow our food and forage.

Meanwhile, states, counties, and towns can put in place more protective inexpensive management practices that will at least reduce some of the risks. These would include permanently prohibiting land application on grazing fields to prevent contamination of meat and dairy products; immediate incorporation of sludge into the soil to prevent pollutants from moving off site; prohibiting stockpiling; permanent pH management to prevent metals and other contaminants from becoming bioavailable; much more protective horizontal and vertical buffers from occupied buildings; and limiting the acreage and frequency of application. The number of individuals and organizations that oppose land application is growing. There isn't a community in the country that welcomes the arrival of sludge trucks. Many farmers are no longer taken in by the brochures and videos that promise instant savings and high yields from this free mislabeled "natural organic" fertilizer. Over a hundred environmental organizations--- many supporting sustainable farming practices–-oppose growing food and forage on biosolids-treated land. Among them are the Sierra Club, the Natural Resources Defense Council, the Rodale Institute, the Institute for Agriculture and Trade Policy, Western Growers, the National Farmers Union, the Food Rights Network, and the Organic Consumers Association. All of these organizations depend on impartial scientific information to form their policy positions. 6 In conclusion PA legislators might be interested in the recommendations of Professor Jordan Peccia, Associate Professor of Engineering at Yale University and Professor Paul Westerhoff, Professor at the School of Sustainable Engineering at Arizona State University in their paper titled, We Should Expect More out of Our Sewage Sludge: The culmination of previous incremental technologies and regulations aimed at solving a current treatment problem, rather than developing the practice for the higher goals of sustainability have resulted in sludge becoming an economic and social liability. Sludge management practice must shift from treatment of a liability toward recovery of the embedded energy and chemical assets, while continuing to protect the environment and human health. This shift will require new research, treatment technologies and infrastructure and must be guided by the application of green engineering principles to ensure economic, social and environmental sustainability. 103

Dr.Snyder References

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Appendix A

For land application to continue under the current policies, it was essential for the Pennsylvania Department of Environmental Protection (PA DEP) to deny that sludge might have caused the death of a Pennsylvania child. Len Martin compiled a chronological and detailed account of how, for almost two years, the PA DEP went to extraordinary lengths to hide the circumstances of Tony Behun's death. In October 1994, 11-year old Tony had ridden his dirt bike through sludge that had been applied to a reclaimed mining site. The child developed headache, sore throat, furuncles on one leg and arm, difficulty breathing, and a high fever. On October 21, a week after he had been exposed to sludge, Tony died of staphylococcal septicemia. In 1999, Tony's mother, who had heard that sludge was causing health problems in other parts of the country, sought answers from the state about her son's mysterious death. The PA DEP repeatedly and publicly denied that there was any connection between sludge exposure and her son's death. According to public statements made by the agency and the company that had spread the sludge, Tony's death resulted from a bacterial infection caused by a bee sting, and sewage sludge had not been applied on the mining site. In May 2000, PA DEP secretary, James Seif, drafted a report claiming that both the National Institute of Occupational Safety and Health (NIOSH) and the state health department had investigated the case thoroughly and ruled out sludge as the cause or contributing factor of Tony's death. Every one of the above-cited claims proved to be false. The DEP was forced to retract the fabricated bee-sting story; truck weigh slips indicated that about 5,600 wet tons of sludge had been spread on the site next to the child's home; and on August 7, 2000, the PA Department of Health sent a letter to State Representative Camille George confirming that the department "in fact, did not conduct an investigation into Tony Behun's death." NIOSH also stated that it "had no involvement [in the case] because "our agency only investigates workers' health complaints." Subsequent public testimony by EPA's Robert Bastian about this case illustrates how EPA and the state agencies responsible for land-application policies work together to misrepresent facts to cover up incidents. On March 13, 2001, Bastian presented Seif's false report to the NAS panel that was seeking input about alleged health incidents linked to sludge-exposure. Bastian assured the panel that "the findings of [PA] state and local health officials have indicated that the Pennsylvania death was not attributable to biosolids".

Appendix B

Quantitative Risk Assessment Risk models are one tool used by industry and agencies to help determine whether or not a product or practice is reasonably safe. It is not a very reliable tool, because it is based on assumptions that can vary from assessor to assessor. For example, when a group of EPA scientists used four accepted models to calculate the cancer risk posed by trichloroethylene in drinking water, their risk estimates varied by a factor of 100 million. 63 If risk assessments for one chemical in one medium can yield such different results, how can it be a reliable tool to identify the various environmental and health risks from such a complex and unpredictable mixture as sewage sludge, spread on complex terrestrial ecosystems, affecting a variety of living organisms with varying susceptibility to infections? With so many unknowns, with stressors that have not even been identified, much less characterized, for which we do not yet know all the modes of action, and all the various potential synergistic interactions between chemicals and chemicals and pathogens, which we are just beginning to identify, any quantitative risk assessment will be an exercise in futility. The more complex a system, the more the uncertainties and the variables, the more unreliable are mathematical models used to assess risks.

Land application of sludge is wrought with uncertainties. Experts estimate that sludge generated in industrialized urban centers and most land applied sludge is generated in these areas—contains not only pathogens and toxic metals, but thousands of anthropogenic chemical compounds for which there are not even basic toxicity data. Many known unregulated sludge pollutants are carcinogenic, persistent, and/or toxic; endocrine disrupting chemicals can damage living organisms in parts per trillion. Pathogens are evolving and becoming more virulent. Only a very few E. coli 0157:H7 bacteria, as little as ten, can cause life threatening disease. Making it impossible to determine what pathogen level in sludge is safe, especially since people' susceptibilities to infectious agents differ and they are exposed to other stressors from other sources. QRA is not suitable for mixture toxicity, for interactions between chemicals, between chemicals and pathogens, and between pathogens. 21,30,40,57,102 It cannot account for toxic synergistic interactions, 19, 21,30,57,70,84 especially those between hormone disrupting chemicals. 40, 102 Essential to any valid risk assessment is to describe the amount and effects of the components in a complex mixture. With sludge, this cannot be done. Depending on risk assessment alone will never explain why sludge exposed people are getting sick.

Prof. Murray McBride, Cornell University has noted that - "Once contaminated … the contamination will remain for decades or centuries" and, "Is it reasonable to conclude that there is little or no risk of land-applying a material (biosolids) containing unknown concentrations of thousands of chemicals with undetermined toxicities?"

Prof. Jordan Peccia- Yale University states that - "biosolids contain heavy metals, hazardous organic chemicals, microbial pathogens, and antibiotic resistant bacteria … Metals and organic chemicals that resist biological mineralization can sorb to solid particles and also accumulate in sludge. These include polybrominated flame retardants, pharmaceuticals like Prozac and Tagamet, human hormones such as estrogen, antibiotics, narcotics including cocaine, and the metabolites of these compounds."

The Swedish Government has recently noted that - "since biosolids contain environmental and health hazardous substances, drug residues and microplastics, our task force will propose a ban on spreading sewage sludge on farmland" https://bit.ly/2PRKdFk

So too, the German Environment Agency recently stated that - "With the precautionary principle and in light of the pollutants found in biosolids, we deem the agricultural use of biosolids to be a serious public health & environmental hazard & advocate that this practice be phased out" https://bit.ly/2SXfLIQ

Think for a moment about just how absurd this "biosolids" business model really is. The wastewater treatment facilities have spent a great deal of time and effort collecting, concentrating, and segregating the pollutants out of the water ... so why on earth would we turn around and put those piles of toxins back into the environment we just eliminated them from? That is truly a short-sighted practice that merely supports a business model based on "pushing" pollution. Situating a gasification / pyrolysis (or clean incineration) plant directly beside the water facility would dramatically cut trucking costs, and cut the huge carbon emissions this constant transport inevitably involves.