Testimony on the Land Application Section of Proposed H.211 – April 12, 2017 to the House Committee on Natural Resources, Fish and Wildlife

Good morning. My name is Jim Fay and I am the General Manager for Champlain Water District (CWD) in South Burlington. As Vermont's largest public drinking water, we provide water to 75,000 people, or 12% of the State's population. CWD is a municipally chartered regional organization supplying both drinking water and fire protection to twelve (12) municipal water systems within Chittenden County. CWD's dual water source intakes are located one half mile off shore at a depth of 75' in the northern channel of Shelburne Bay in Lake Champlain. CWD's "First in the Nation" Excellence in Drinking Water Treatment process results in a safe drinking water treatment residual (DWTR) that, after using Vermont's cold winters to produce a natural freeze-dried product, has tremendous potential to improve management of phosphorus and protect water quality. DWTRs absorb and immobilize phosphorus from agricultural runoff, urban stormwater, and wastewater, thus preventing excess phosphorus from reaching Lake Champlain. The use of DWTRs can help Vermont achieve water quality goals required under the Total Maximum Daily Load (TMDL) for Lake Champlain.

CWD's engineered freeze/dry residuals process was bonded in 2001 and constructed in 2003 at a cost of $2,000,000 with assistance from Dr. James Martel of the Cold Regions Research and Engineering Laboratory (CRREL) in Hanover, New Hampshire. We built two roof-covered freeze/dry beds totaling 23,500 square feet allowing the Vermont winters to dewater our filter and clarifier backwash residuals into a material resembling freeze-dried coffee. CWD's DWTRs consist of zooplankton, diatoms, and other naturally occurring Lake Champlain ecosystem particulate materials that are removed by filtration at the drinking water treatment facility using aluminum sulfate (alum) as the coagulant. There are no sanitary wastes, sewage sludge, or septage materials ever associated with the residuals. It is noted for this reason DWTRs were not included in the January 16, 2015 "Report on the Management of Wastewater Treatment Sludge and Septage in Vermont" referenced in this draft H.211 bill. Currently CWD residuals are transported to a neighboring composting facility; other utilities send their DWTRs to wastewater treatment plants or landfills. CWD's DWTRs are distinct from sewage sludge and septage in that they do not contain the microbial and nutrient pollutants that characterize those wastes and therefore should not be listed as a material to be prohibited from land application in H.211. Rather, CWD believes that its engineered "freeze/dried" DWTRs needs to be put to a more beneficial use to help control P in the Lake Champlain Basin and elsewhere where they can safely help us achieve our water quality goals at essentially no cost.

We have done extensive research on the effectiveness of CWD's drinking water treatment residuals to immobilize phosphorus, and for additional information on our work; I would like our consultant Don Meals to provide you with additional details.

D. W. Meals testimony to House Committee on Natural Resources, Fish and Wildlife on H. 211 [4/12/2017]

My name is Donald W. Meals and I am a resident of Burlington. As an environmental scientist, I have conducted extensive research on nonpoint source pollution issues in the Lake Champlain Basin and elsewhere in the U.S. for the past 40 years. My career has focused on agricultural nonpoint source pollution and on understanding how phosphorus, pathogens, and other pollutants move through the landscape and into waterways. Much of my work has concerned polluted runoff from agricultural land and on evaluating the effectiveness of new management practices to reduce phosphorus and pathogen losses from land to water. I have served as a national expert on agricultural nonpoint source pollution across the U.S. for the U.S. Department of Agriculture and the U.S. EPA.

I am here today on behalf of the Champlain Water District (CWD), Vermont's largest regional public water supplier, serving 75,000 people in twelve municipal water systems in Chittenden County. Several years ago, the CWD engaged me to conduct studies of the potential use of their Drinking Water Treatment Residuals (DWTRs) to reduce phosphorus pollution in the Lake Champlain Basin. Based on the results of those studies and on my familiarity with the scientific literature on DWTRs, I am here to recommend that this House Committee delete the mention of "water supply treatment plant" from the sources of materials to be kept from land application as presented in Section 5(a)(2) of the current draft of H.211 (line 3, p. 7). This should be done because DWTRs are quite different from wastewater sludge and/or septage and because DWTRs have important beneficial uses when applied to the land. I base my recommendation on the following points:

1. DWTRs differ significantly from septage or waste products from wastewater treatment processes and do not present the same pollution risk. DWTRs are generated as part of the process of removing naturally-occurring fine particulate material from the raw water drawn from Lake Champlain. In addition to alum (aluminum sulfate) and iron, the DWTRs contain clay particles, diatoms, zooplankton, and other fine particulates that may occur in the Lake water; these particulates are removed from the raw water as part of the treatment process. The DWTRs do not include and never come into contact with untreated or treated sewage or septage and contain no pathogens not already present in the original lake water. Moreover, because the Lake is not grossly polluted with toxic or organic chemical contaminants, DWTRs do not contain high levels of heavy metals or organic pollutants. The available nutrient content of DWTRs is quite low, especially compared to that of septage or wastewater sludge, and in fact one of the most important characteristics of DWTRs is their ability to adsorb and bind nutrients and make them unavailable for plant growth.

2. DWTRs have a large capacity to bind phosphorus, reducing its solubility in water and making it unavailable to plants, including algae. Research across the U.S. and in Vermont has shown that alum-based DWTRs can immobilize significant amounts of phosphorus and prevent its release to waterways. Historically, alum has been used to reduce high concentrations of phosphorus in lakes and "lock-up" phosphorus in lake sediments; in the 1980s, Lake Morey in Vermont was an early success story in lake restoration through the use of alum. Both pure alum

and alum-based DWTRs have been used for decades to treat poultry manure in the Chesapeake Bay region and elsewhere to reduce its phosphorus content prior to land application. In pilot experiments in Vermont, addition of CWD DWTRs to liquid dairy manure yielded up to 80% reductions in the soluble phosphorus content of the manure; even a relatively low dose of 5 to 10% DWTRs added to manure could reduce soluble phosphorus content of the manure by 20 to 30%. Levels of heavy metals like arsenic and lead in the original DWTRs have been very low (below established safety thresholds) and have been below analytical detection limits in treated manure. Concerns over aluminum, arsenic, and metals seem to be small, as long as soil pH and application rates are managed properly. In farm-scale tests in Vermont, application of DWTR-amended manure did not increase soil levels of aluminum, iron, or trace elements or change the pH of agricultural soils. Direct addition of DWTRs to soils has been shown to increase the phosphorus-holding capacity of the soil, reducing the risk of runoff and leaching losses of dissolved phosphorus by up to 90%. Published research has shown that the binding effect on phosphorus is stable over the long term, more than 20 years.

3. DWTRs represent a valuable resource in the effort to reduce phosphorus loads to Vermont waters, available free of charge.

Across the U.S. (and elsewhere), DWTRs have been used in Best Management Practices (BMPs) to control phosphorus with little environmental risk; for example:

- To amend buffer strip soils to capture more phosphorus before runoff enters a waterway;
- To reduce runoff and leaching of P from agricultural fields receiving manure;
- To capture phosphorus in ground water;
- To increase phosphorus absorption in constructed wetlands.

Early results from preliminary studies in Vermont have shown that CWD DWTRs can be successfully used to remove phosphorus from tile drainage water coming from cropland. DWTRs have also been used to remove phosphorus from urban stormwater and from treated wastewater.

Pilot tests in Vermont have suggested that the available supply of CWD DWTRs could treat 12.75 million gallons of dairy manure at a dose of 5% (the annual waste production of 2,200 dairy cows) and bind 2.6 tons of soluble phosphorus annually. This represents a significant contribution to the effort to reduce phosphorus loads to Lake Champlain from agricultural runoff and one that is available essentially free of charge. Additional quantities of DWTRs may be available from other drinking water treatment operations in Vermont.

In summary, because they do not pose nutrient or pathogen pollution risks and because they represent an important tool in the effort to reduce phosphorus loading to Vermont waters, I recommend that DWTRs be removed from the list of materials proposed to be banned from land application in H.211.

Additional testimony by Champlain Water District's Jim Fay on Section 1 and 2 of H.211 - 4/12/17

In regards to Section 1 of this proposed H.211 bill, the Champlain Water District would like to submit the following comments:

Drinking water in this country is regulated under the Safe Drinking Water Act (SDWA) and the State of Vermont has "primacy" for the enforcement of all SDWA regulations. Federally, the public notification rule is based on three stages of public notification. These stages are referred to as a Tier 1, Tier 2, or Tier 3, and each tier is based on the public health risk to the served customers. Tier 1 is basically immediate notice given the public health risk, Tier 2 is within a thirty-day period as there is no immediate public risk, and Tier 3 requirements dictate an annual notice as there is not a direct health impact as the violation, for example, could be a paperwork/reporting error. In the State of Vermont, the Drinking Water and Groundwater Protection Division of DEC has made the Tier 1 federal requirements more stringent by cutting the notification time in half for immediate health risk situations. DEC also has the authority, which they have exercised in the past, for immediate notice as a situation may dictate. These State of Vermont Tier 1 requirements are being embedded in the water systems' operating permit as recent changes have been made in this permitting area by the State.

This public notification proposal within H.211 seems to take the wording from a past wastewater bill which was specifically for combined sewer overflows, and apply it to every imaginable set of circumstances that could occur with a drinking water treatment facility or a water distribution system, whether or not there is a health risk based threat. It is very important to drinking water suppliers to communicate to the public effectively in a public health risk based manner. H.211, as it is proposed, has the unintended consequence of communicating too often with the public in situations with very limited consequences, if any, resulting in the public ignoring a critical health based public notification. At this time, the Department of Environmental Conservation is doing an excellent job in their approach to public notification and these additional requirements under H.211 would not add value to the existing notification process.

The Champlain Water District would also like to supply comments on Section 2 of H.211 related to cyanobacteria monitoring and notification. CWD has been involved in national research on the topic of blue/green algae toxins since 2005. The Lake Champlain Committee has coordinated a volunteer monitoring program on Lake Champlain since 2003. Over the last several years water suppliers working with the Department of Health, and DEC have developed a monitoring program for all drinking water intakes on Lake Champlain. Therefore, the data that the State of Vermont has collected since 2003 results in one of the most comprehensive databases in the U.S. on this topic. The Vermont Department of Health hosts an online map where all reports are compiled and can be accessed by the public in a real-time manner. The State's blue/green algae monitoring program is a tremendous partnership effort between many organizations and this program is truly a model for every State in our country. Changes to this program are not needed at this time and future changes and improvements should be dictated by the experts that are involved in the program on a day-to-day basis based on public health risk and public health benefits.