

My name is Sam Nicolai, and I am Vice President of Engineering & Compliance for Casella Waste Systems. I am also a licensed Professional Engineer, and have more than twenty years of experience in environmental engineering for solid waste and industrial facilities. I am testifying today in reference to the Senate bill that proposes to require the Agency of Natural Resources to adopt water quality criteria for PFAS compounds, as well as require landfills to treat landfill leachate for PFAS compounds prior to disposal at wastewater treatment facilities.

As landfill owners and operators, Casella has been involved with the management of PFAS compounds as emerging contaminants over the last several years. In each of the six states where we operate solid waste management facilities, we have been working with state regulators and other stakeholders to better understand the presence of PFAS compounds in our wastewater and our solid waste. Specifically in Vermont, our landfill in Coventry was one of the six landfills that ANR evaluated by testing landfill leachate for PFAS compounds. PFAS was identified in the leachate in all six facilities, at levels similar to the majority of landfills throughout the US. However, I do note that landfill leachate is only one media where PFAS compounds have been identified. PFAS compounds have been consistently identified in residential septic systems, in wastewater treatment facilities regardless of whether landfill leachate is present, and in soil and groundwater associated with manufacturing facilities and fire training centers. As you are likely aware, we, as a society, have been using consumer products containing PFAS since the 1940s, as well as its presence in firefighting foams and other industrial applications. Some studies have shown that more than 95% of tested adults have detectable PFAS concentrations in their blood, due to the widespread use of these chemicals in our lives.

In addition to the analytical testing of leachate, ANR specifically evaluated whether landfill leachate is being acceptably managed at the Vermont wastewater treatment facilities (WWTP). In its December 17, 2018 memo, ANR concluded that "...there is no potential acute risk to human health or the environment with the management of leachate at a WWTP..." This conclusion was based on the analytical testing of the wastewater treatment effluent, and consideration for the body of water receiving the discharge. With respect to the landfill leachate, these evaluations were also fairly conservative since they assumed that the landfill leachate was the only source of PFAS to the WWTPs – which is almost certainly not true.

Even though ANR's evaluation confirmed that the current management of landfill leachate at the WWTPs is acceptable, work continues to better understand the presence and management practices for PFAS. Specifically at the Coventry Landfill, the facility's new solid waste management certification includes provisions for an evaluation of the PFAS-containing solid wastes being received at the landfill, as well as an engineering assessment of potential onsite and offsite treatment options for the landfill leachate. This work is scheduled to be completed and submitted to ANR later this year.

Although much work still remains to be done, we expect that the waste evaluation will confirm that PFAS is present in a wide variety of waste streams and is not limited to only a few sources. There may be opportunities to manage specific waste streams differently if appropriate alternatives exist, but given the ubiquitous nature of these compounds, we will be generating PFAS-containing solid waste for decades to come.

We also expect that the engineering assessment of treatment options will provide several potential options to consider. Although treatment of these compounds can be challenging, there are technologies that show varying degrees of effectiveness. However, based on the available research, pretreatment of leachate specifically to selectively remove PFAS alone will not be possible; treatment will need to

address any and all constituents within the leachate. The management of any residuals is an important component of the work. Potential treatment options that involve filtration such as reverse osmosis (RO) or granular activated carbon (GAC) are transferring contaminants from one media (leachate) to another (brine or spent carbon) that requires disposal.

Finally, the comparison between potential onsite and offsite treatment options will be significant. There are various advantages and disadvantages in addressing PFAS by modifying or adding to an existing WWTF, or the construction of a stand-alone treatment facility. Of course, this engineering evaluation is specific to the landfill leachate generated at our Coventry facility, but will not specifically address the five other landfills in Vermont with confirmed PFAS detections in leachate.

Given that ANR has specifically confirmed that landfill leachate is being acceptably managed at WWTFs today, and that the engineering assessment of treatment are ongoing, we believe that the proposed bill to require treatment of landfill leachate before receipt at WWTFs is not appropriate. The specific work being done for the Coventry Landfill as well as the broader work being done in the industry needs to be used to determine the best management practices for these compounds in the future. WWTFs serve as the disposal endpoint for leachate for the vast majority of landfills in the U.S., and will continue to do so in the future.