THE STATE OF NEW HAMPSHIRE

SUPREME COURT

2020 TERM

CASE NO. 2020-0058

THE PLYMOUTH VILLAGE WATER & SEWER DISTRICT, RESOURCE MANAGEMENT,
INC., CHARLES G. HANSON, and 3M COMPANY
Plaintiffs

v.

ROBERT R. SCOTT, AS COMMISSIONER OF THE NEW HAMPSHIRE DEPARTMENT
OF ENVIRONMENTAL SERVICES
Defendant

RULE 8 INTERLOCUTORY APPEAL FROM RULING OF
THE MERRIMACK SUPERIOR COURT

BRIEF AS *AMICUS CURIAE*

NORTH EAST BIOSOLIDS AND RESIDUALS ASSOCIATION

in support of Plaintiffs

The North East Biosolids and Residuals Association (NEBRA) respectfully submits this *amicus curaie* brief in support of plaintiffs Plymouth Village Water & Sewer Department, Resource Management Inc., Charles G. Hanson, and 3M Company. Submission of this brief is with assent of Plaintiffs and the Defendant; see written documentation of assent in Exhibit C, below.

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NEBRA'S ROLE AS *AMICUS*

NEBRA is a 501(c)(3) professional association registered as a non-profit corporation in New Hampshire, with a mission to advance the environmentally sound and publicly-supported recycling of biosolids and other organic residuals in New England, New York, and eastern Canada. NEBRA membership includes the environmental professionals, scientists, and organizations that produce, treat, test, consult on, and manage most of the region's biosolids and other large volume recyclable organic residuals. NEBRA's members are the professionals who, every hour of every day, implement protections of public health and the environment by treating and managing wastewater and associated materials. NEBRA is funded by membership fees, donations, and project grants. Its Board of Directors are from CT, MA, ME, NH, VT, and Nova Scotia. NEBRA's financial statements and other information are open for public inspection during normal business hours. For more information: http://www.nebiosolids.org. NEBRA members in New Hampshire include all of the state's major municipal wastewater treatment facilities and their biosolids and residuals management programs, as well as private companies managing biosolids, septage managers, a paper mill, and several consulting engineering firms with offices in NH.

Organic residuals are putrescible waste materials containing carbon that are derived from plants and animals, including food scraps, manures, paper mill sludge, leaves and brush, and sewage sludge. Sewage sludge is the material separated from water at wastewater treatment facilities. Biosolids are sewage sludge that has been treated and tested and meets regulatory standards for application to soils as a fertilizer or soil

amendment. Septage is the liquid material pumped from residential and business on-site septic systems.

Plaintiff Plymouth Village Water & Sewer District has been a member of NEBRA in the past. Plaintiff Resource Management, Inc. is a member of NEBRA now. In filing this brief, NEBRA is supporting these members, as well as all of its New Hampshire members and members beyond New Hampshire, because the actions of the New Hampshire Department of Environmental Services (NHDES) in the promulgation the maximum contaminant levels (MCLs) and ambient groundwater quality standards (AGQS) for per- and polyfluoroalkyl substances (PFAS) in June 2019 present significant impacts – and continuing potential impacts – on their professional work and the budgets and operations of the public and private organizations for which they work.

NEBRA believes that this brief provides a unique perspective and supporting information based on decades of productive engagement with NHDES around numerous wastewater- and biosolids-related topics, including participation in several NHDES formal rule-making efforts; numerous comments on policy, regulation, and legislation; and participation in NHDES public stakeholder groups. Indeed, it is because of our long experience with excellent stakeholder involvement processes and communications initiated and facilitated by NHDES that we feel particularly aggrieved by the unusual rush, lack of stakeholder process in the dramatically-altered final rules, and unresponsiveness to our concerns during the development of the current PFAS MCLs and AGQS, which are the central topic of this case.

STATEMENT OF THE FACTS

NEBRA defers to the Statement of the Facts and of the Case in the briefs by the Plaintiffs and relies thereon. To that record, NEBRA provides details from its involvement in the NHDES policy and rulemaking for the PFAS MCLs and AGQS.

NEBRA'S INVOLVEMENT IN NHDES PFAS POLICY AND RULEMAKING

NEBRA has worked extensively on the issue of PFAS related to biosolids management since January 2017. In the biosolids management profession, NEBRA is recognized as a leading resource in North America on PFAS and biosolids science, research, and policy. Over the past three years, as NHDES moved aggressively forward in testing and understanding PFAS in waters and other media, NEBRA participated in stakeholder discussions, legislative hearings, and NHDES meetings. NEBRA took advantage of every opportunity to provide formal comments as the PFAS drinking water MCLs and AGQS were discussed and developed. NEBRA and other stakeholders have urged NHDES to be careful in its regulatory actions related to PFAS because of potential unintended costly impacts to municipal and utility programs. NEBRA's comment letters are attached as Exhibit A.

NEBRA records show PFAS-related meetings and communications with NHDES and other state staff began in late February 2017. The first formal meeting with NHDES staff was on March 30, 2017, in Merrimack. Looking back to that beginning conversation, NEBRA believes its concerns and recommendations for proceeding more carefully – which were repeated by NEBRA and other commenters (e.g. the NH Municipal Association) over the next two years – were not given adequate attention by NHDES, the

Governor's office, and the legislature as the state rushed forward with regulations, adding to the public fervor on the issue. The result is the current situation in which a) municipalities and utilities are facing significant, unanticipated costs and potential liability because of regulations improperly adopted without adequate consideration of costs and benefits; and b) the biosolids, residuals, and septage management marketplace and associated wastewater management operations in NH have been disrupted by regulatory uncertainties and public perceptions that could have been avoided by more prudent regulatory actions (as are happening in states such as Alaska, Michigan, Virginia, Washington, and the majority of other states; see below).

In addition, from that beginning meeting onward, NEBRA staff perceived that the NHDES staff working on wastewater and sewage sludge and biosolids, who are the most knowledgeable within NHDES regarding wastewater and biosolids management and science, were having their perspective pushed aside by those in the groundwater and site remediation bureaus and senior management. That disagreement within NHDES has been evident for three years. NEBRA believes there was a lack of understanding and experience regarding the management of wastewater, biosolids, and residuals among those at NHDES who were making the critically-important policy and regulatory decisions related to PFAS. It seems to NEBRA that these decision-makers have not appreciated the complexities and challenges of maintaining and operating wastewater utilities and associated services, such as biosolids management, and how PFAS regulations indirectly impact these operations to the detriment of the environment and local communities.

As the September 30, 2019 effective date for the new regulations

approached, municipalities and other stakeholders were evaluating risk and liability and costs, and some began making decisions that could be irreversible, further disrupting wastewater, septage, and biosolids management markets. Concerns were raised about the possibility that 50,000 wet tons of biosolids normally recycled to soils in New Hampshire might need to find a new home. That would be an untenable situation, and NHDES staff seemed shocked by this development, even though NEBRA and others had warned about it for two years. At a September 19th meeting convened by NHDES at its offices in Concord, NHDES asked municipal and utility stakeholders to discuss the "elephant in the room" – the growing concerns about costs and liability that are clearly falling on municipalities and utilities. The ensuing two-hour conversation failed to come to resolution. When asked if the Department could provide assurance that municipalities and utilities would not be held liable, at least in the interim, for average, low-level PFAS contamination about which they have had no knowledge or control, so they could plan budgets and upcoming operations, NHDES said it could not do so. Regarding how PFAS are going to be dealt with in the context of the existing, complex and effective waste management system, Assistant Commissioner Clark Freise said "Today, we don't have an answer." For more than two years, NEBRA and other stakeholders have been asking NHDES to work with NEBRA and other stakeholders to figure out that answer, *before* imposing the most stringent PFAS regulations – the MCLs - in the country (as of that time).

In the current state budget, NHDES has been provided $6 million for two years for PFAS-related efforts. According to what NEBRA has heard from NHDES, of the $6 million, some will go to small drinking water systems and "a lot of it will go to studies" (statement by Clark Freise to stakeholder meeting, September 19, 2019, NHDES offices, Concord, NH). Little will be

provided to help wastewater utilities – only enough to cover the costs of testing municipal materials (biosolids, wastewater) for one year. There is no additional money related to PFAS for upgrading facilities, installing treatment systems, and paying higher costs for biosolids and residuals disposal related to PFAS.

NHDES has repeatedly noted that it does not have the resources to complete the work required of it, particularly the full analysis of costs and benefits of the new regulations. Not only did this admission appear in the documents supporting the proposed MCL and AGQS regulations, it was also stated in testimony and meetings. For example, on January 11, 2018, Sarah Pillsbury of the groundwater bureau at NHDES testified to a state House committee related to several PFAS bills that "there are some real practical considerations that you have to look at to set a standard…. DES has lack of resources. Other states where they are setting standards have large agencies with lots of resources…." This was an accurate statement. For example, even Pennsylvania was stating, at the time, that it would not develop MCLs for drinking water, because the state did not have the resources necessary to do so.

As the MCL rulemaking process continued to march ahead in the Spring of 2019, NEBRA became increasingly alarmed, as did other municipal and utility interests who also felt their input was being dismissed by NHDES. Together, in an April 1, 2019 letter, they asked Commissioner Scott for a meeting. The letter stated: "As DES moves forward with setting MCLs, and as we watch developments in other jurisdictions, we wish to clearly convey to you our grave concerns about the potential for regulatory actions to jeopardize related environmental programs that are core to the operations and budgets of municipalities, including water and wastewater utilities, and

septage and wastewater management, and biosolids and residuals management."

When the requested meeting was held April 11, 2019, NEBRA and other water quality and municipal organizations provided NHDES a proposed agenda, in which they stated: "With regard to the myriad diffuse releases of PFAS throughout the state, from landfills, some businesses, and wastewater and residuals management – including municipal systems: based on the current level of knowledge, these lower level sources do not appear to be causing significant water contamination at levels relevant to current screening standards. This means there is time to pause and develop a plan, with municipal participation." Attendees at the meeting included several prominent municipalities, top NHDES leadership, and leading stakeholders in the management of biosolids in NH.

On June 28, 2019, NHDES announced its final PFAS MCL regulations, just before the July 4th weekend, with minimal attention to the concerns of municipalities and utilities NEBRA and others had raised for more than two years (https://www.des.nh.gov/media/pr/2019/20190628-pfas-standards.htm). In response, NEBRA and other stakeholders provided letters to the Joint Legislative Committee on Administrative Rules (JLCAR), requesting delay in JLCAR's consideration of the new final proposal, to allow stakeholder review and noting violations of due process. In addition, NEBRA stated:

> "if low numerical standards are absolutely needed for public health protection, then we all need to recognize and forthrightly address the fact that they could dramatically disrupt wastewater, septage, and biosolids (and other) operations throughout the state and impose significant,

> unexpected costs on public utilities, municipalities, and other stakeholders. We have not seen plans to address this from DES. Instead, we have just received the new proposed MCLs for four PFAS in the past week – and our concerns are heightened. These MCLs would be the only such formal, enforceable standards in the U. S. (other than one number in New Jersey). This is a big step that no other state has taken, despite years of discussion and pressure on some of them. The cost implications are large when going from DES's current *de facto* enforcement value of 70 parts per trillion (ppt) for PFOA + PFOS to the proposed standards in the teens of ppt. Routine municipal waste management activities – including septic systems, septage and biosolids management, wastewater treatment, and landfills – critical public health functions – will be impacted with hundreds of millions of dollars of unanticipated costs in the next few years. If this is necessary to protect public health, then so be it. But the money has to come from somewhere, and DES has not done what was required of it and identified all the costs of its proposed rules, nor proposed a plan for where the money will come from."

NEBRA and its members prepared testimony and showed up at the JLCAR meeting, only to be thwarted by JLCAR's decision to take no comments.

In September, 2019, NEBRA became aware of the current legal action being brought by the Plaintiffs. On October 16, 2019, the NEBRA Board of Directors, supported by the membership, voted to request *amicus* status in

the Superior Court (trial court). NEBRA filed its *amicus* brief with that court on October 17, 2019. Some of the text from that brief is repeated herein.

SUMMARY OF THE ARGUMENT

Harm has been done to Plaintiffs and similar stakeholders. Impacts are not caused just by direct regulation of an entity, but are also caused by indirect and anticipated factors, including liability concerns suddenly created by the actions of a regulatory agency. There are numerous examples available regarding increased costs attributable to the NHDES lowest-in-the-nation MCL and AGQS standards.

The trial court was justified in enjoining the MCL and AGQS regulations because NHDES failed to adequately consider costs and benefits. NEBRA and other stakeholders – and NHDES itself – repeatedly discussed and wrote about ways such analysis could be done, creating expectations that such analysis *would* be done.

In New Hampshire, setting an MCL results, by law, in the setting of an AGQS. The trial court properly recognized this and imposed the injunction on both regulations. NHDES consistently addressed, presented, and discussed the MCL and AGQS regulations simultaneously. There is no public documentation of which NEBRA is aware that indicates any consideration or mention of adopting an AGQS for PFAS separate from the PFAS MCLs. In New Hampshire, an MCL triggers the setting of an equivalent AGQS, and that was the assumption throughout the development of the PFAS MCL and AGQS regulations. Because of that, without the MCL, the AGQS has no, or only an incomplete, basis.

Contrary to the implication in the Defendant's opening brief, numerous expert stakeholders have disputed details of the science – the foundational research, the assumptions, the uncertainty factors, and the calculations – applied by NHDES in developing the PFAS MCLs that are central to this case. At every opportunity for comments, NHDES took in several detailed critiques of the science upon which NHDES was relying. The June 2019 NHDES response to comments includes discussions of questions of science, many of which still continue to be disputed and debated.

Contrary to the statements of other *amici* to this case, testing for PFAS has occurred extensively throughout New Hampshire and will continue to occur. Substantial data and information for protecting public health with regards to PFAS are available to New Hampshire residents.

Other states are taking different approaches to regulation of PFAS, especially with regards to regulations that could affect the management of wastewater and residuals. Other states are recognizing that their regulatory actions have the potential to impact important environmental and public health programs and that they must move more carefully to understand the relative risks of PFAS found in various matrices and situations and address them with appropriate, nuanced policy, regulation, and guidance.

And, finally, but significantly, NHDES was not required to adopt the regulations by any particular date. The agency was required to initiate the process by January 1, 2019, but the end date was in its control. According to its own statements, NHDES had limited resources and had never created an MCL before. Yet the agency rushed ahead, citing less science than similar efforts conducted by, for example, U. S. EPA, and relying heavily, in the end, on one newly-published research paper.

THE ARGUMENT

1. Harm has been done to Plaintiffs and similar stakeholders.

The NHDES PFAS MCLs and AGQS, finalized in summer 2019 and enjoined by the trial court, have already impacted NH water and wastewater treatment utilities, municipalities, and small businesses in tangible, costly ways. Setting MCLs and AGQS impacts not just drinking water facilities, but also wastewater utilities and biosolids management operations, including numerous NEBRA water quality professional members. Several examples follow.

- A family business, that is not a NEBRA member, managing septage for the good of society, has been put out of business because of liability and costs related to NHDES PFAS regulatory actions. The company's septage management activities impacted neighbors' wells with PFAS above NHDES standards, and NHDES is placing liability on the company as a "responsible party." However, the company operated under NHDES permits and approvals for three decades, and the PFAS it received at its site came to them unknown, in the septage, never even measurable until recently. The PFAS received by this business in the septage it managed was and is from widespread use of these chemicals by society, in all our homes and businesses, since the mid-1900s. Even if NHDES is correct in its allegations that some septage may have been managed at the site outside of permit terms, the fact is that the PFAS impacts are substantially from typical, domestic septage. It does not seem fair that a small company providing an essential public health service with NHDES approval must pay for a broad societal issue that it had no hand in creating.

  Other septage management businesses are facing the same immediate threats from PFAS regulations to today: NHDES has found groundwater impacts above the new PFAS AGQS at two-thirds of the State's septage management facilities. Will all those companies be put out of business now, because of past PFAS coming to them unbeknownst? If that happens, where will septage be managed?

Much of it currently goes to municipal wastewater facilities. But available data on PFAS levels in septage show levels often twice as high as the PFAS in current biosolids. Why should municipal wastewater facilities assume the risk and potential liability of accepting septage, now that NHDES has made it clear they may be charged as responsible parties? NEBRA members are concerned about getting caught up in similar liability, because NHDES has clearly stated that a utility or municipality would be tagged as a responsible party in just the same way, if PFAS impacts on waters are found related to a municipal wastewater and/or a biosolids management program.

- A NH municipality, which is a NEBRA member, was tagged in just such a way in Spring of 2018. In the prior late fall, driven by its focus on biosolids as a "source" of PFAS, NHDES found somewhat elevated PFAS levels in a drinking water well near a long-term biosolids land application site. One of two tests was slightly above the U. S. EPA 70 ppt public health advisory screening value. NHDES assumed biosolids were the cause and asked the municipality that owned the biosolids site to remediate the situation and pay all costs involved. NEBRA and several of its members expressed concern to NHDES that the agency was jumping to conclusions related to biosolids management. The source of the PFAS in that one well is uncertain. The municipality, in deference to NHDES and to show good faith, paid for a PFAS treatment system to be installed at that house. But this NHDES action raised concerns at wastewater utilities and municipalities that they were going to be held liable, even though their operations are fully permitted and overseen by NHDES and are merely receiving PFAS that is present widely because of ubiquitous use for more than 50 years. This exposure to risk and liability are disconcerting to municipal leaders and is leading to decisions such as transporting wastewater solids to Canada at double the cost and with significant impacts on energy use, greenhouse gas emissions, and NH farm economics.

- The Merrimack, NH wastewater utility (a NEBRA member) has investigated the cost of landfilling its biosolids compost, which may prove necessary under the new PFAS MCL regulations, even though its compost has average PFAS levels when compared to NH and other states' biosolids test data. Research to date suggests such levels do not present any significant public health risk. The Merrimack compost, which has been a prized, consistent, highly-effective soil

amendment product in the broad soil materials marketplace – selling for up to $50 per yard – would be thrown away. The additional annual cost to Merrimack's biosolids management program and local ratepayers would be from $550,000 for in-state disposal, if available, to as much as $2,000,000 per year for out-of-state disposal. In addition, customers deprived of cost-effective Merrimack compost would suffer economic impacts as well.

- One paper mill – a NEBRA member – states that, because of the new regulations, "We are now required to test our SPF annually for 9 PFAS compounds. Also our cost to recycle our SPF went up dramatically (>50%) in August, 2019 due to concerns by receiving sites about liability of landspreading." Their cost for managing solids has increased from about $35,000 per year ($28 per wet ton) in 2018 to nearly $75,000 ($43 per wet ton)."

- A biosolids management company, which provides jobs, benefits, and economic activity in NH, notes that it is now spending unbudgeted funds on a lot of testing for PFAS. They note that "some beneficial use programs for processed sludge have been curtailed and sent to disposal instead." Plaintiff RMI, which is also a biosolids management company, has experienced similar challenges and costs.

- The biosolids from New Hampshire's capitol city, Concord, have been recycled to soils on Concord and area farms for decades – a highly successful recycling practice benefitting Concord ratepayers and area farms. In 2020, this practice has stopped, not because of any direct regulation or requirement formally imposed by NHDES, and not because of any measured or likely risk to public health or the environment, but because of the climate of uncertainty and the threat of liability that NHDES has created around the issue of PFAS. Concord biosolids are no different than all other biosolids in the state: they contain low, average levels of PFAS compounds, similar to those found nationwide. They are not one of the very rare biosolids that are impacted by industries using large amounts of PFAS and discharging them to a wastewater facility. The PFAS in Concord biosolids come from residents' homes and businesses – from all of us. Yet NHDES, in its actions and statements, has helped create a dark cloud over biosolids recycling. Concord's biosolids are now being hauled to Canada, where they are recycled by composting. This spring, local farms have lost this cost-effective nutrient source. Concord's biosolids management costs have more than doubled. Ratepayers

will pay an extra $500,000 this year. Greenhouse gas emissions and other impacts of the Concord program have increased. Yet NHDES has not quantified any measurable benefit gained by these additional costs and this disruption.

None of the kinds of cost impacts discussed above were covered to any significant extent by NHDES in its published estimates of expected costs associated with the adoption of the final MCL and AGQS rules. What NHDES did estimate – more than $260 million for capital installations and a year of maintenance operations – was narrowly focused on drinking water treatment systems and a few wastewater systems. The NHDES cost estimate did not include entire categories of significant expenses that will be borne by municipalities, utilities, companies, and other stakeholders, as the final MCLs and AGQS are implemented. As a result of PFAS regulation – especially the very low numerical standards in the final MCLs and AGQS – municipalities are struggling today to estimate future costs and establish reasonable budgets.

2. The trial court was justified in enjoining the June 2019 MCLs and AGQS regulations because NHDES failed to adequately consider costs and benefits in accordance with the intent of the Legislature.

In Winter and Spring of 2018, NEBRA attended hearings and witnessed testimony on Senate Bill 309-FN and other bills related to setting regulatory standards for PFAS. The topic of costs and benefits was raised repeatedly. The inclusion in SB 309 of the following language was deliberate: "After consideration of... the costs and benefits to affected parties that will result from establishing the standard." This was meant to be more than a cursory "consideration," and NHDES communications repeatedly acknowledged this. For example, in its January 4, 2019 report on the

proposed MCL and AGQS regulations, NHDES admitted to the inadequacy of its effort by comparing that effort to "EPA and Office of Management and Budget guidance, which entails determining costs associated with a number of different potential standards and capturing marginal costs" (Summary Report on NHDES Development of Maximum Contaminant Levels and Ambient Groundwater Quality Standards for PFOS, PFOA, PFNA, and PFHxS, p. 11). That and other statements by NHDES confirmed the expectations for some kind of substantial cost / benefit analysis in the setting of the New Hampshire MCLs and AGQS. The NH Municipal Association (NHMA), the Granite State Rural Water Association, and NEBRA urged further consideration of costs and benefits in a joint letter in April 2019. But now, in court, NHDES is walking back expectations related to the robustness of the consideration of costs and benefits, minimizing the intent of the discussions before the Legislature.

NHDES expressed further awareness of the inadequacy of their consideration of costs and benefits and built expectations about a more thorough analysis of benefits, when they stated "NHDES currently has no quantified value of benefit, although there is likely significant benefit to reducing exposure to these compounds through drinking water…. NHDES intends to further evaluate the possibility of quantifying benefits of these standards…." (Summary Report on NHDES Development of Maximum Contaminant Levels and Ambient Groundwater Quality Standards for PFOS, PFOA, PFNA, and PFHxS, p. 16).

In addition, in that January 4, 2019 report, in its brief discussions of analyses of costs and benefits, NHDES described what would be appropriate protocols for consideration of costs and benefits, including contingent valuation of benefits and, regarding costs, "determining costs associated

with a number of different potential standards and capturing marginal costs." As noted above, this concept is a central consideration in the cost/benefit discussions in this case. Having mentioned the concept of marginal costs, NHDES decided not to consider them at all. But marginal costs and benefits are all that matter in understanding the impacts on affected parties of the new MCLs and AGQS. NHDES was not starting from zero PFAS regulation. Since spring of 2016, NHDES has regulated PFAS using the U. S. EPA public health advisory level of 70 ppt for the sum of PFOA and PFOS as a *de facto* standard. People with drinking water wells testing above that number have been provided bottled water and connections to community water systems. That 70 ppt standard was – and still is – the enforceable AGQS. The question NEBRA has raised repeatedly, and which has not been answered, is what the *marginal* benefit is from changing from that *status quo* – the 70 ppt standard – to the more restrictive MCL and AGQS. NEBRA has argued that any marginal benefits likely fall within the large margins of uncertainty in toxicological calculations and are likely minimal to none. Yet the costs associated with the new regulatory standards are already substantial, as noted above. See Exhibit A, NEBRA verbal comments to NHDES, March 12, 2019.

Lastly, NHDES further exposed the inadequacy of its "consideration" of costs and benefits in its formal response to comments, published on June 28th, at the time of the final regulations, stating "Because NHDES was mandated by the Legislature to establish the MCLs and AGQS, any costs attributable to the standards are directly attributable to the law, not the rules." But the Legislature did not mandate NHDES to choose MCLs at the extreme low end of the range of MCLs being developed; that was the choice and responsibility of NHDES. And the attendant costs associated with going

from the *de facto* 70 ppt standard to standards in the teens are directly attributable to NHDES actions.

As part of its June 2019 announcement of the dramatically-lower MCLs and AGQS, NHDES attached a report from the Nordic Council of Ministers ("The Cost of Inaction…."). That report, and NHDES comments about it, also fail to address the concept of *marginal* benefits. Repeatedly, NHDES ignored an opportunity and responsibility to provide this important information as part of the process of creating the PFAS MCLs and AGQS.

If PFAS were rare and easy to remove from wastewater and the environment, water quality professionals – NEBRA's members – would embrace their immediate removal. If benefits are clear, the public servants gladly spend funds to the public good. But pretty much all of New Hampshire's wastewater and biosolids receive PFAS not from some industrial source, but from everyone's homes and businesses, where they have been in common use for decades. Local wastewater treatment facilities cannot be responsible for traces of contaminants they receive and have minimal control over. And they need justification – demonstration of benefit – to spend ratepayer and taxpayer money.

In May 2020, an independent evaluation of the costs and benefits of the NHDES MCLs and AGQS regulations was completed by independent consultant Tracy Miller (PhD in economics, University of Chicago), with help from Lisa Bradley (PhD in toxicology, MIT). The true costs of the new rules are substantially greater than NHDES has maintained. This report is an example of an appropriate approach for assessing costs and benefits of the regulations (http://www.neratepayers.org/new-england-ratepayers-association-releases-cost-benefit-analysis-of-new-hampshires-proposed-

adoption-of-pfas-mcls/).

3. In New Hampshire, setting an MCL results, by law, in the setting of an AGQS. The trial court properly recognized this and imposed the injunction on the combined regulations that NHDES promulgated simultaneously.

Waters are not compartmentalized, and neither are the regulations pertaining to them. As the Defendant notes, quoting the RSA, (Defendant's Opening Brief, pp. 8 – 9), "Where state maximum contaminant levels have been adopted under RSA 485:3, I(b), ambient groundwater quality standards shall be equivalent to such standards." In other words, in New Hampshire, setting the MCLs *determines* the AGQS. Throughout the work on the PFAS MCL and AGQS regulations, NHDES developed, discussed, and communicated about both regulations together, always. NHDES conducted no additional or separate scientific review or risk assessment related to the AGQS alone. If the MCLs are enjoined, the AGQS have no leg to stand on. If, as the defendant has now decided to argue, the process of setting the MCLs and the process of setting the AGQS "are distinct" (Defendant's Opening Brief, p. 37), then NHDES has provided little separate justification for these particular numbers for the four regulated PFAS in groundwater.

Further, there are further practical, real-world impacts of setting MCLs and AGQS; those standards inevitably influence standards for surface waters and soils. There is a domino effect. Surface waters and soils receive wastewater effluent and biosolids, which means the standards for those are also influenced by the MCLs and AGQS. As NHDES stated in its January 4, 2019 report: "An AGQS also dictates the conditions under which wastewater and wastewater residuals may be discharged to groundwater" (Summary Report on NHDES Development of Maximum Contaminant Levels and

Ambient Groundwater Quality Standards for PFOS, PFOA, PFNA, and PFHxS, p. 4). In the real world, NHDES actions to set some of the lowest MCLs and AGQS anywhere in the world has caused substantial ripple effects and is the sole reason Concord's wastewater treatment program and its ratepayers are spending an additional $500,000 this year to transport biosolids to Canada.

NHDES recognized that its MCLs and AGQS are untenable for at least some wastewater treatment facilities – those that discharge to groundwater. As part of the package for regulations accompanying the setting of the MCLs, NHDES included exemptions for those few wastewater treatment facilities in New Hampshire that discharge to groundwater, knowing that their effluent will normally exceed the new AGQS. Under the new regulations, these facilities can continue to discharge to groundwater, even though the effluent exceeds the new AGQS. NHDES had to allow this, because these wastewater treatment facilities provide a critical service to public health and the environment; they cannot be shut down. And the PFAS that they are emitting in their effluent are from average homes and small businesses and are not easy to remove from the wastewater. That action by NHDES indicated that they knew they were regulating PFAS at ambient background levels.

The MCLs and the AGQS are entwined in New Hampshire. The trial court was correct in imposing the injunction on the combined regulations.

4. Numerous expert stakeholders have disputed the science applied by NHDES in developing the PFAS MCLs that are central to this case.

For NHDES to imply, in its opening brief, that it seems the science is not disputed, is wrong. Science has been central to the debate over the

MCLs from the beginning. For example, on November 11, 2018, the New Hampshire Business and Industry Association presented commentary about the developing PFAS MCLs in the *Sunday News*: "Regulating contaminants needs to be based on science."

The first formal comments NHDES requested from stakeholders were due November 9, 2018. Several expert risk assessors submitted comments. One urged "DES set maximum contaminant levels (MCLs) for PFAS at levels that: (i) reflect scientifically sound estimates of adverse health effects based on a holistic analysis of available data." In its initial work on developing the MCLs, NHDES seemed to do this, and the initial MCLs proposed by January 1, 2019, were built on a list of cited references – peer-reviewed research- that NHDES shared with stakeholders. In contrast, the final MCLs relied predominantly on just one, newly-published, peer-reviewed paper. Good policy is founded on the "holistic analysis of available data," not on a single publication.

Other comments submitted for the November 9, 2018 deadline – including those from plaintiff 3M – also addressed the science NHDES was reviewing. And at all subsequent comment opportunities, questions and concerns about the science were raised by multiple stakeholders.

NHDES started the MCL-setting process with a list of more than 200 research papers. The original MCLs, made public on December 31, 2018, rested on this body of research, according to NHDES. This was an impressive body of research, but it was still far fewer publications than cited by the May 2016 U. S. EPA report justifying its 70 ng/L (parts per trillion, or ppt) public health advisory for PFOA and PFOS combined. The process of developing that advisory number included consideration of far more literature and extensive peer review. And the NHDES citations were less

than the body of research listed in an Australian Health Expert Panel report that concluded ""After considering all the evidence, the Panel's advice to the Minister on this public health issue is that the evidence does not support any specific health or disease screening or other health interventions for highly exposed groups in Australia, except for research purposes" (Expert Health Panel for PFAS – Summary, http://www.health.gov.au/internet/main/publishing.nsf/Content/ohp-pfas-expert-panel.htm)

Although they lacked adequate cost and benefit analysis, the original MCLs proposed by NHDES appeared to be moderate and would have moderate costs associated with them. But, in the end, NHDES abandoned moderation and chose to rest its case substantially on a single publication: Goeden et al., 2019. That paper presented a new model that calculates PFAS intake and retention in mothers, fetuses, newborns, and children. The Minnesota Department of Health, where the model was developed, used it to determine new regulatory standards in that state. NHDES suddenly decided to follow Minnesota's lead, but added some additional assumptions so that, notably, the Minnesota numbers for PFOA and PFHxS are two to three times higher than those adopted by NHDES.

In its final promulgation of the PFAS MCL regulations in June, 2019, NHDES chose to regulate PFAS at an extreme level. The agency could have defended any numbers between 10 ppt and 70 ppt (or even higher) with as robust and valid a scientific argument as they presented for their June 2019 MCLs. Indeed, the original numbers they proposed on December 31, 2018, were more defensible than the final numbers.

Toxicology and risk assessment are scientific endeavors, but they are applied with human expert judgment. When there is an abundance of

uncertainty regarding the health impacts of contaminants, as is currently the case with PFAS, assumptions have to be made and there are protocols for applying uncertainty factors in the risk models. Variability in outcomes is the result, and such variability is a clear indication of the continuing uncertainty in the science.

The assumptions NH chose to apply resulted in MCLs that, when finalized, were the lowest numerical standards for PFAS in drinking water in North America at that time. And they remain on par with the other two lowest today. In contrast, the vast majority of states continue to rely on the public health advisory published by U. S. EPA in May 2016, which is 70 ng/L or parts per trillion for the sum of the two most common and most-researched PFAS chemicals, PFOA and PFOS. There is a wide range of numbers for PFAS in drinking water, all based on different experts' assumptions of what constitutes risk. For example, Canada's drinking water standard for PFOS is 40 times the new NHDES MCL. All of these experts and regulatory agencies consider their actions to be protective of human health. But the science remains contested. See "PFAS Regulatory & Guidance Limits for Drinking Water & Other Media – March 2020, " in Exhibit B.

5. Testing for PFAS has occurred throughout New Hampshire and will occur. Substantial data and information for protecting public health are available to New Hampshire residents.

In its *amicus curaie* brief, the Natural Resources Defense Council (NRDC) and Conservation Law Foundation (CLF) argue that the trial court's injunction has not allowed New Hampshire residents to have information about risks from PFAS. This argument is flawed in two ways:

First, NHDES has collected and published data from numerous drinking water systems and private wells throughout the state, as part of it PFAS investigation. The public has access to the results of thousands of water tests and copious advice about water testing for PFAS. (See https://www4.des.state.nh.us/nh-pfas-investigation/). Except in this kind of investigation, the state and drinking water utilities do not test and never pay for testing of private wells; that is the responsibility of the well owner.

Second, New Hampshire has been one of the states most proactive in addressing concerns about PFAS. NHDES aggressively addressed the PFAS issue as it arose at the Pease Tradeport, around the St. Gobain facility in Merrimack, and elsewhere, ramping up efforts dramatically in 2016, long before most states. Since May, 2016, when it was published by U. S. EPA, NHDES has used the U. S. EPA health advisory standard of 70 ng/L for PFOA and PFOS as a *de facto* action-level standard – and continues to do so today. By NH law, that advisory level is the NH enforceable AGQS – still in force now.

These actions by NHDES, especially the highly-appropriate actions related to industrial and fire-fighting sources of large-scale PFAS contaminations, have substantially reduced risk to New Hampshire residents. NEBRA applauds NHDES for these proactive measures. However, NEBRA believes it is important to recognize that addressing the ambient background levels of PFAS that come from our daily living environments – and have for more than 50 years – including the PFAS in wastewater and biosolids, requires careful consideration of all potential unintended consequences. PFAS are, unfortunately, already widely dispersed in the environment. Regulating at close to ambient background levels – as NHDES has done – creates substantial challenges.

Despite what the Defendant's Opening Brief implies and what some *amici* contend, what this case hinges on is not whether or not PFAS chemicals should be or are regulated. Rather, the critical scientific question in this case is whether or not it is necessary, for protection of public health, to set MCLs for four PFAS chemicals in the teens of ng/L (parts per trillion, or ppt) – at the extreme low end of the range of standards being developed – versus the *de facto* standard of 70 ppt.

6. Other states are taking different approaches to regulation of PFAS, especially with regards to regulations that could affect wastewater and residuals.

In comparison to the actions that NHDES has taken related to PFAS and ambient background PFAS, including most PFAS in municipal wastewater and biosolids, it is important to consider that, because of the immature science, the uncertainties, and the widespread presence of PFAS in commerce and the environment, the vast majority of U. S. states have not proceeded in regulating PFAS, relying instead on use of the U. S. EPA public health advisory screening value of 70 ppt for PFOA and PFOS in drinking water and investigating the high-profile, high-contamination industrial and fire-fighting activity contamination situations. Those state actions are the ones that are reducing potential public health risks most dramatically.

Alaska After initially sampling and testing for PFAS proactively, including investigation of PFAS in wastewater and biosolids, early in 2019 the state suspended further action on setting site clean-up and other standards, pending action by U. S. EPA.

New York New York is proceeding very slowly with setting MCLs and appears to be including consideration of costs and benefits. Back in

2016 – 2017, New York had acted quickly with regards to one residuals management program and then learned that the issue was more complex and uncertain than they initially realized. Experts in biosolids risk assessment at the New York Department of Environmental Conservation told NEBRA in November 2017 that they had conducted screening assessments and modeling of PFAS in biosolids and residuals and found that the "modeling they've done, compared to the tested levels found in residuals, suggests that – except for one compost – none of the residuals have any issue…. For now, DEC is not feeling a need to test more in this area." (NEBRA contemporaneous notes from phone call with NY DEC, November 13, 2017). Wastewater, biosolids, and residuals management in New York have not been disrupted since.

Virginia Like other states, Virginia is working with the U. S. Department of Defense to address large PFAS contamination incidents around military sites, but is otherwise tracking the issue and waiting for further U. S. EPA guidance. The Virginia Department of Environmental Quality has not chosen to initiate widespread sampling and testing.

Washington Washington has carefully developed a standard Chemical Action Plan for PFAS, following the same processes used for addressing other chemicals of emerging concern. The draft includes coverage of wastewater and biosolids and municipal activities and concerns. Ample public comment period has been provided, and the path to further investigation and possible regulation has been laid out clearly by the Department of Ecology. There is no rush to run out and sample matrices far and wide; such sampling has not been done. The Plan comes first. Meanwhile, the Washington legislature passed laws to reduce the use of

certain PFAS in commerce, a demonstrated, cost-effective public policy approach.

Michigan Michigan is particularly sensitive to water quality and contaminant issues, after the Flint lead crisis. The state has aggressively addressed the PFAS issue, with proactive testing and investigation at many sites statewide. But, different from New Hampshire, the environmental regulatory agency recognized early on that wastewater and biosolids contain PFAS normally and that those facilities that needed attention were those few that have large, ongoing industrial discharges of PFAS. They worked with the wastewater facilities and industries to remove PFAS upstream, reducing the levels in wastewater and biosolids. They are supporting continued biosolids recycling and have decided not to try to set any more numerical standards that could have unintended consequences. They await further action by U. S. EPA.

The vast majority of states, like Alaska, Virginia, and Michigan, are tracking the issue and waiting for further U. S. EPA guidance. Meanwhile, in November 2018, Canada adopted the following regulatory standards for drinking water: 200 ppt PFOA, 600 ppt PFOS. See Exhibit 3. NHDES leadership chose to go extreme on its MCLs and AGQS.

7. NHDES was not required to adopt the regulations by any particular date.

NHDES faced no deadline to complete the regulatory process of setting MCLs and AGQS for PFAS. The legislative mandate was silent on the completion date. NHDES repeatedly admitted it did not have adequate

resources to develop a full assessment of costs and benefits. NHDES noted that U. S. EPA processes to establish MCLs can take years and far greater resources than NHDES had available. However, NHDES leadership made the choice to spend considerable money and staff time scrutinizing and raising public alarm about not only the significant contamination sites, but also known lower-risk PFAS situations, including wastewater and biosolids, causing disruptions of those programs. NHDES leadership chose to set an aggressive time schedule, presumably because of several loud public advocacy voices and some pressure from particular political leaders. Instead, NHDES could have given itself more time and could have directed its funds toward understanding the potential impacts of various regulatory choices and conducting more thorough consideration of costs and benefits.

NHDES is supposed to *lead* environmental regulation development *based on science*, not according to current pressures. That kind of leadership has been evident in measured actions and innovative policies at NHDES in the past. NEBRA continues to be concerned that the agency's actions related to PFAS have reached out ahead of the science and beyond the level of known risks related to PFAS, especially with regards to ambient background levels of PFAS that are conveyed in municipal and utility operations (wastewater, biosolids, solid waste). The result is the current situation in which a) municipalities and utilities are facing extraordinary, unanticipated costs and potential liability because of regulations improperly adopted without adequate consideration of costs and benefits; and b) the biosolids, residuals, and septage management marketplace and associated wastewater management operations in NH have been disrupted by regulatory uncertainties and public perceptions that could have been avoided by more prudent, balanced, incremental regulatory actions.

As a result, today, NH businesses and public utilities are making decisions based on a heightened fear of PFAS liability that does not exist in most other states. This acts as a drag on the affected organizations and New Hampshire's business climate. Decisions being made now by NEBRA members and other stakeholders are sometimes irreversible: a company put out of business is not coming back, and the shift to disposal of biosolids in landfills means increased costs to certain farmers, lost jobs in the recycling sector, and increased greenhouse gas emissions and other environmental impacts. NEBRA believes these impacts could have been avoided if NHDES had followed due process, paid attention to recommendations to think ahead about the impacts of regulatory actions, and completed the analysis of costs and benefits of the final PFAS MCL and AGQS regulations.

CONCLUSION

For the reasons stated above, this *amicus curiae,* NEBRA, respectfully requests that the Court uphold the trial court's action and provide the relief requested by the Plaintiffs.

Respectfully submitted this 29th day of May, 2020,

By: _____

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ORAL ARGUMENT

Amicus NEBRA respectfully requests no time for oral argument, but will attend and be available to provide information and clarification on any of the information presented herein.

STATEMENT OF COMPLIANCE

NEBRA hereby certifies that pursuant to New Hampshire Supreme Court Rule 26(7), this brief complies with New Hampshire Supreme Court Rule 26. Further, this brief complies with New Hampshire Supreme Court Rule 16(11), as it does not exceed 9,500 words.

CERTIFICATE OF SERVICE

I hereby certify that on this 29th day of May, 2020 a copy of this BRIEF OF THE NORTH EAST BIOSOLIDS AND RESIDUALS ASSOCIATION AS *AMICUS CURIAE* has been transmitted via the NH Supreme Court's electronic filing system to the following: Christopher G. Aslin, Esq.; K. Allen Brooks, Esq.; Timothy Bishop, Esq.; Nessa Horewitch Coppinger, Esq.; Joseph A. Foster, Esq.; Michael Quinn, Esq.; Mark C. Rouvalis, Esq.; Beth A. Deragon, Esq.; Terri L. Pastori, Esq.; Paul J. Twomey, Esq.; David Creer, Esq.; Thomas Irwin, Esq.; Amy Manzelli, Esq.; Robert Gustafson, Esq.; Natch Greyes, Esq.; Stephen C. Buckley, Esq.

THE STATE OF NEW HAMPSHIRE

SUPREME COURT

2020 TERM

CASE NO. 2020-0058

THE PLYMOUTH VILLAGE WATER & SEWER DISTRICT, RESOURCE MANAGEMENT, INC., CHARLES G. HANSON, and 3M COMPANY

Plaintiffs

v.

ROBERT R. SCOTT, AS COMMISSIONER OF THE NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES

Defendant

RULE 8 INTERLOCUTORY APPEAL FROM RULING OF THE MERRIMACK SUPERIOR COURT

BRIEF AS *AMICUS CURIAE*

NORTH EAST BIOSOLIDS AND RESIDUALS ASSOCIATION

EXHIBITS

EXHIBIT A: NEBRA comments submitted to NHDES during the MCL and AGQS rulemaking process

EXHIBIT B: PFAS Regulatory & Guidance Limits for Drinking Water & Other Media

EXHIBIT C: Assents by Plaintiffs and Defendant regarding NEBRA filing this *amicus* brief

EXHIBIT A

NEBRA comments submitted to NHDES
during the MCL and AGQS rulemaking process

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North East Biosolids & Residuals Association

Cooperatively promoting the environmentally sound recycling of biosolids and other residuals

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November 9, 2018

Re: Technical input on deriving MCLs for drinking water (and groundwater)

Dear Ms. Pillsbury,

Thank you for the opportunity to provide technical input regarding the work of the Department of Environmental Services (DES) on establishing MCLs for several PFAS chemicals, as required by law. We greatly appreciate the Department's stakeholder input meetings held in mid-October, the handouts provided there, and the ongoing postings of information on the DES PFAS webpage (https://www4.des.state.nh.us/nh-pfas-investigation/), including the draft list of references posted November 8th.

These comments are submitted by NEBRA. We have, however, been working with several water quality groups and technical experts in the water quality field and municipal operations (including many NEBRA members) regarding understanding PFAS and its implications for water system operations. Our missions and goals align closely with those of DES and the broad public interest: to protect water resources throughout the State. Our members strive to always provide our communities with the highest levels of services and protections possible within the constraints of technical feasibility and budgets.

Our groups and our members are still learning about PFAS and are recognizing the complexity of PFAS chemistry, fate, transport, and impact, as well as related policy. We are aware that actions related to PFAS have been and can be expected to be costly, and we seek to work with DES and all stakeholders to find the right balance to ensure full protection of public health without overtaxing ratepayers and municipal and utility budgets.

Because of the complexities presented by PFAS, this letter provides only an overview and general questions and recommendations regarding the technical process and data for setting MCLs for the four specified PFAS. We give examples, but not exhaustive input, regarding parameters and calculations that we recommend DES address in order to provide a thorough assessment, as required by the process for setting MCLs. Our groups can provide more details and data upon request, especially regarding cost calculations. Careful assessments of costs and benefits are critically important if we, as a state, are going to find the right balance.

We look forward to DES responses to these concerns. And we look forward to working with the Department on this important step in public health and environmental protection.

This letter specifically addresses what DES has requested: technical input on the "approach, data and studies to be used for setting MCLs" for drinking water (and, by legal default, ambient groundwater quality) for PFOA, PFOS, PFNA, and PFHxS, including regarding the following:

1. "Beyond the studies considered in the recently released ATSDR Toxicity Profiles and the existing EPA Health Advisories, are there other studies or data that should be considered in deriving the health risk limits for each contaminant?
2. "What data and methodologies should the agency consider in deriving a benefit value?
3. "What data and methodologies should the agency consider in deriving a cost value?"

1. Assessing the Toxicology and Health Impacts – Additional Information

We have limited ability to assess the toxicology of PFAS compounds. We, and other stakeholders in this process, are relying heavily on the review being conducted for DES by Dr. Steve Roberts (Univ. of Florida) of the ATSDR draft Toxicological Profiles for PFOA and PFOS, as well as input from David Gordon of DES and the newly-hired toxicologist and newly-hired risk assessor. While we respect the credentials of these experts, we consider the process by which they are providing input to be less rigorous than, for example, the formal peer-review process by which EPA established its Public Health Advisory (PHA) levels for PFOA and PFOS published in May 2016. We urge the Department to give the appropriate level of extra weight to that EPA process. All but a handful of states - including New Hampshire so far – have given deference to that expert evaluation.

Given the importance of the DES review of the toxicology in setting MCLs, we ask that, in advance of proposing numbers, DES share with all stakeholders – and allow time for review of – reports by these experts. We need to see the rationale for the health risk assumptions they recommend. The list of references DES is looking at is large, but it is not as exhaustive as those that other teams of reviewers have looked at (e.g. the process of setting EPA's PHA or the Australian Health Expert Panel or the ATSDR draft Profiles). Good science dictates recognition of the limitations of the toxicology review that DES is able to manage in the time frame and with the resources it has available.[1]

[1] We were concerned to learn as recently as the October 19th stakeholder meeting, that the NH DES staff reviewing the toxicology were not even aware of the Australian Health Expert panel report, which was released in the spring, and which concluded "After considering all the evidence, the Panel's advice to the Minister on this public health issue is that the evidence **does not support** any specific health or disease screening or other health interventions for highly exposed

If DES decides to consider varying the MCLs for PFOA and PFOS away from the peer-reviewed EPA level, it should do so with great care, applying the mantra that "extraordinary conclusions require extraordinary evidence." Thus, DES should give equal effort to consideration of arguments for setting MCLs for PFOA and PFOS lower than 70 ppt and arguments for setting higher MCLs. We are aware of arguments being made for lower MCL numbers. But we are uncertain that the research being cited in support of those arguments has had the same level of scrutiny as was applied, for example, by EPA for setting its PHAs (which have been challenged also from both directions). We are also aware of arguments being submitted by other stakeholders in this process that suggest that the EPA PHAs for PFOA and PFOS are overly conservative for several reasons, including, but not limited to:

- multiple, layered uncertainty factors applied
- assumption that humans have greater PPARa response than the laboratory animals from which data for the risk level was extrapolated (the opposite is true),
- the selection of studies for data inputs that involved measured biological changes that were transient,
- EPA's reference dose is overly protective, and
- The assumed percentage of exposure from drinking water is likely overestimated.

For those of us who are not toxicologists and risk assessors, all we can do is note that there are conflicting opinions. DES needs to assess to what extent staff involvement with this issue and the inputs received have created any level of embedded bias, one way or the other, and attempt to reduce its influence in this MCL-setting process.

Health impacts of PFOA and PFOS

There are abundant data and numerous documents debating the health risks association with PFOA and PFOS, some of which we have noted above. The ATSDR draft Toxicological Profile and the comments provided on it, along with the Australian Health Expert Panel report, provide plenty of information. We have nothing further to add at this time.

Health impacts of the less-studied PFNA and PFHxS

In the DES handouts for the stakeholder meetings for this MCL-setting process, there appears to be recognition of a paucity of robust data on negative health effects for PFNA and PFHxS. While PFOA and PFOS have been studied more extensively, there appear to be fewer data on these other two PFAS chemicals. However, at least for PFHxS, there is research cited by manufacturers that claim less risk from this shorter-chain compound, even though its half-life persistence in the human body seems to be longer than other PFAS (which is concerning).

In any case, looking at DES's handouts, one of the two health outcomes for PFNA and PFHxS listed by DES as a concern is "decreased antibody response to vaccines." This outcome is also listed for PFOA and PFOS. The research on antibody response to vaccines stems mostly from work with the population of the Faroe Islands. We have concerns that DES seems to be relying considerably on these studies. Questions arise: How have the researchers managed to isolate the impacts of

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groups in Australia, except for research purposes" (emphasis in original). Expert Health Panel for PFAS – Summary, http://www.health.gov.au/internet/main/publishing.nsf/Content/ohp-pfas-expert-panel.htm

particular PFAS chemicals, separating these chemicals from the traces of other chemicals and elements found in the blood serum of this population and other populations? A recent paper from the same group (Hu et al., 2018) shows that even these scientists are still trying to figure this out themselves![2] Indeed, some of their research published in 2011 places the blame for this measured effect on PCBs.[3] How can these researchers and DES be sure which of the 4 PFAS chemicals being addressed in the MCL-setting process or some other PFAS or some other chemical is causing the "decreased antibody response to vaccines?"

Another related question: Does the reduced antibody response fall clearly outside of the range of the normal distribution of antibody response in the general population? This question should also be asked of the other reason for health concern about PFHxS: increases in serum lipids, especially cholesterols. There are numerous factors affecting cholesterol levels, and we are not convinced research has clearly discerned that PFHxS is a major factor. Does DES have convincing evidence? And, a related question: does the presumed amount of increase due to PFHxS actually have any significant health impacts? Those producing PFAS chemicals cite research they say indicates less concern about PFHxS and shorter-chain PFAS compounds. We cannot determine who is right. But we expect DES to be able to defend its MCLs based on sound research. For PFNA and PFHxS, the reasons for health concerns seem relatively meager.

We also want to express here our concerns about the increasingly common practice of regulatory agencies in this region of lumping PFAS chemicals together for regulatory simplicity. There are valid reasons for doing so, although the science does not really support the practice: half-lives and measured effects differ significantly between these chemicals. However, at the very least, if regulatory agencies – including DES – utilize this approach, it should be with recognition that they are actually applying yet another layer of uncertainty factor tipping the balance toward even more

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[2] "The relative importance of different PFAS exposure sources has proven difficult to discern, both within and across populations. This information is essential for attributing adverse effects to particular PFASs or mixtures and for prioritizing actions to minimize health risks. Complex mixtures of PFASs in human sera may be further altered by variability in toxicokinetics." Hu et al., 2018. https://www.researchgate.net/publication/322875074_Can_profiles_of_poly-_and_Perfluoroalkyl_substances_PFASs_in_human_serum_provide_information_on_major_exposure_sources#pfd

[3] "A total of 587 children participated in the examinations at ages 5 and/or 7 years. At age 5 years, before the booster vaccination, the anti-diphtheria antibody concentration was inversely associated with PCB concentrations in milk and 18-month serum. Results obtained two years later showed an inverse association of concentrations of antibodies against both toxoids with PCB concentrations at age 18 months; the strongest associations suggested a decrease in the antibody concentration by about 20% for each doubling in PCB exposure. At age 5 years, the odds of an antidiphtheria antibody concentrations below a clinically protective level of 0.1 IU/L increased by about 30% for a doubling in PCB in milk and 18-month serum. In conclusions developmental PCB exposure is associated with immunotoxic effects on serum concentrations of specific antibodies against diphtheria and tetanus vaccinations. The immune system development during the first years of life appears to be particularly vulnerable to this exposure." - Weihe and Grandjean, 2012. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3305740/

conservative numerical standards. This is not a transparent way of adding additional uncertainty factors.

Conclusion

Again, we are not the experts on the toxicology and risk assessment. And the above discussion only gets into a few questions and concerns. What we want to emphasize is that:

- There are many uncertainties and assumptions that will go into the Department's ultimate risk calculations;
- Those assumptions need to be very solidly grounded in the full preponderance of peer-reviewed science.
- DES needs to provide extraordinary evidence for diverging from EPA's PHA.

Given the potential costs for addressing PFAS levels in drinking water and other waters in the state, it is critically important that the Department be able to defend the toxicology it selects.

It is important to note – and humbling – to recognize that very few jurisdictions have decided to adopt MCLs lower than the EPA PHA. The vast majority of jurisdictions, both in the U. S. and overseas, have not gone in that direction (Tables 1 and 2).

Table 1. State advisories & standards for drinking water that are different from EPA Public Health Advisory levels for PFOA + PFOS of 70 ng/l (ppt) (mostly from ITRC Regulations, Guidance, and Advisories Fact Sheet)

	PFOA	PFOS	PFNA	PFHxS	PFHpA	PFBS	Notes
Alabama							
Alaska							
Arizona							
Arkansas							
California							
Colorado					70		
Connecticut	70 (sum of 5 PFAS)						
Delaware							
Florida							
Georgia							
Hawaii							
Idaho							
Illinois							
Indiana							
Iowa							
Kansas							
Kentucky							
Louisiana							
Maine							
Maryland							
Massachusetts	70 (sum of 5 PFAS)						
Michigan	420	11					2014, non-cancer values
Minnesota	35	27		27		2000	
Mississippi							
Missouri							
Montana							
Nebraska							
Nevada	667	667				667,000	Basic comparison levels
New Hampshire							
New Jersey	14	13 proposed	13				
New Mexico							
New York							
North Carolina							
North Dakota							
Ohio							
Oklahoma							
Oregon							
Pennsylvania							
Rhode Island							
South Carolina							
South Dakota							
Tennessee							
Texas							
Utah							
Vermont	20 (sum of 5 PFAS)						
Virginia							
Washington							
West Virginia							
Wisconsin							
Wyoming							

Table 2. International standards for drinking water (ITRC Regulations, Guidance, and Advisories Fact Sheet, updated Table 4.1, November 2017)

Location	Year	PFOA	PFOS	PFNA	PFBA	PFBS	PFHxS	PFHxA	PFPeA	PFHpA	PFOSA	PFDA	6:2 FTS
Australia	2017	560	70				70						
Canada	2016	200	600	200	30000	15000	600	200	200	200			
Denmark	2015	100	100	100	100	100	100	100	100	100	100	100	100
Germany	2006	300	300										
		100	100										
Italy	2017	500			7000	3000		1000	3000				
Netherlands	2011		530										
	2011		5.3										
Sweden	2014		90										
	2014	90	90			90	90	90	90	90			
UK	2009	10000	300										
	2009	300	300										
	2009	10000	1000										
	2009	90000	9000										

2. Benefits

"What data and methodologies should the agency consider in deriving a benefit value?"

Public health protection is costly, and cost alone should not be a deciding factor when setting an MCL for drinking water. Those of us involved in water quality protection apply this fact daily.

However, in our water quality work, we are always aware of the fact that the costs – no matter what the scale – need to be justified by tangible public health protection improvements. Therefore, we ask that DES *comprehensively* calculate costs and benefits in setting these MCLs. Because PFAS are particularly complex and unusual chemicals – persistent, highly mobile and dispersive in waters, presenting groundwater implications via air emissions (!), etc. – setting drinking water MCLs for them will potentially create unintended consequences, affecting programs other than just drinking water (as discussed under "Costs," below).

We understand – and are pleased – that DES is engaging academic experts for assistance is quantifying benefits for this MCL-setting process. We have two areas of concern and recommendations:

1. As DES evaluates the benefits of setting an MCL at one number versus some other number, it is important to recognize the fact that, because of the range of values being considered, we are talking about *marginal* benefits. There is no option of not setting an MCL. And we

understand that it may be unlikely – and perhaps just for socio-political reasons – for DES to consider setting MCLs in the 100s of ppts (where some other countries have landed; see Table 2). ***So, wherever DES ends up in setting MCLs, the vast majority of the potential health benefit has already been attained***.[4] ***DES needs to keep this fact in mind when defining and calculating the benefits. A decision cannot be grounded on comparison to a "no MCL" option.*** For example, for PFOA and PFOS, the proper calculation of benefits should involve comparison of the current 70 ppt PHA and, perhaps, the 20 ppt standard set in Vermont and the 200 ppt (PFOA) and 600 ppt (PFOS) values used in Canada. What will be the relative benefits within that narrow range of options? These benefits are what are then compared to the cost differences calculated for the same possible MCL values.

2. The "benefit" of addressing PFAS concerns with a particular MCL should also involve the "opportunity costs" (for lack of a better term) of the funds expended. Opportunity costs are discussed below.

3. Costs

"What data and methodologies should the agency consider in deriving a cost value?"

There are unusual challenges in trying to estimate costs related to establishing MCLs for the four targeted PFAS chemicals. Below, we discuss some of the questions and concerns we have, but we expect there may be additional ones. We hope DES will consider these in developing the MCLs.

Note that for all the examples, below, the full costs need to be calculated to include:

- The cost of any technology, such as a treatment system using granulated activated carbon (GAC);
- Local labor and materials, such as for investigation, sampling & analysis (pre- and post-treatment), site work, system installation, and ongoing maintenance (this involves at least public utility/municipal labor and private consultant labor);
- Indirect costs, such as salaries and fringe benefits of existing staff whose time is required or any new staff required to meet the mandate;
- The cost of hiring consultants such as engineers or attorneys;
- The cost of computer programming or reprogramming;
- Costs such as printing of forms or travel expenses; and
- DES labor and materials, such as for investigation, oversight, mitigation plan review, post-mitigation follow-up, record-keeping, and reporting/communicating to the public.

We guess that DES will develop and present full cost calculations for two or three proposed levels of MCL – such as 20 ppt (like VT), 70 ppt (EPA's PHA) and 200 & 600 ppt (Canada). These will illustrate the considerably greater costs involved when far more systems have to be treated, which will be the case with a lower MCL. The increased costs are likely to be mostly caused by there being more situations to address, rather than the unit costs of treatment being greater if you want a lower level in the final water; for example, GAC systems appear to remove the key target PFAS chemicals well

[4] Indeed, for PFOA and PFOS, the fact that these chemicals have been phased out of use in the U.S has resulted in dramatically reduced human exposure already, as evidenced by NHANES blood serum sampling.

enough to get below 20 ppt for the same cost as getting below 70 ppt. This assumption may be accurate for drinking water treatment, but might not apply to treatment in other systems (e.g. wastewater).

The costs developed for two or three possible MCL levels for each chemical in this way will provide valid comparison to the benefits calculated, as discussed above.

Drinking Water Systems

At the stakeholder meetings, DES stated that there are ample data on the costs of treating drinking water. DES can access data from the following prominent examples of installed treatment systems:

- large public drinking water well at Pease International Tradeport
- public school well at Marlow
- water line extensions around the industrially-impacted areas in Amherst and Merrimack
- private home wells

In calculating potential costs related just to treating drinking water, DES will presumably create representative estimates of the unit costs considering each of the bulleted items above. These unit costs will then be multiplied by the number of actual wells or situations testing above the proposed MCL.

Municipal Wastewater Treatment Systems, Septic Systems, & Lagoons

DES sampling and analysis, and data from other states and the literature, indicate that the four PFAS in this MCL-setting process are pretty much always found in wastewater. They have been found and should be anticipated in septic systems[5], wastewater and septage lagoons, and biosolids and residuals (e.g. paper mill residuals). This is because of their ubiquitous use in consumer products. Tens of parts per trillion of several different PFAS are found in domestic wastewater. And parts per billion (single numbers to 10s of ppb) are found in solids of small towns with no industrial sources whatsoever.

The behavior of PFAS in these materials and in soils is not well known. However, DES is understandably concerned about the potential for migration of at least some PFAS from these materials to groundwater and/or surface water at levels that are in the range of MCLs being considered. This is the challenge of PFAS.

These facts mean that the management of wastewater, both in centralized wastewater treatment facilities and in septic systems, has come under scrutiny and will be affected by how low the MCL is set. The costs for treating wastewater to low levels would be very high – far higher than treating drinking water, because of the higher levels of particles and other contaminants that will quickly deplete a GAC system or, more likely, require pre-cleaning of the water through further filtration before treating it for PFAS removal.

[5] Septic systems likely are impacting groundwater and drinking water; a study on Cape Cod (Schaider et al, 2013) found PFOS & PFOA in 40% and 10% of wells, respectively. And the maximum concentrations were 97 and 22 ppt. That could mean more small drinking water wells will be above a, for example, 20 ppt MCL for one or more of the four PFAS chemicals.

We are not sure if DES has in place regulatory structures for addressing all of the questions that arise. For example:

- If wastewater effluents exceed the drinking water MCL upon discharge, how will DES address that? Will dilution factors be calculated in, as is common with other contaminants covered in discharge permits?[6]
- Some wastewaters are discharged to groundwater through sand filtration systems. How will DES address these situations where there is less dilution? If treatment of wastewater effluent became necessary, the costs to a town the size of Merrimack could be several million dollars, plus ongoing increased operating costs.
- We find PFOA and PFOS in parts per billion in our blood serum and in wastewater solids, and yet we are regulating them in drinking water at levels two orders of magnitude lower. In other words, only 1% of the PFAS in wastewater solids (be it land applied or in a landfill) has to get into drinking water or groundwater to contaminate that drinking water or groundwater at or above the MCL.

How will DES quantify the potential costs of a low MCL on the management of these materials? At what level of MCL will these materials become seen as hazardous and thus requiring of alternative management? And how will DES measure the opportunity costs of spending money on reducing PFAS in these materials versus putting equivalent funds into reducing other risks?

Already, concerns about PFAS have resulted in disruptions to wastewater solids management programs in New York, New Hampshire, Massachusetts, and Vermont. Some of these disruptions have been directly caused by rushed regulatory actions and some have been caused by private interests worried about the potential for future regulatory actions creating newly-recognized liability. If these programs that recycle biosolids to soils are further impacted in New Hampshire, a crisis in the management of solids could ensue.

Already, the uncertainty about PFAS and future regulations has generated increased costs for one New Hampshire municipality: a landfill that was taking screenings from a biosolids management process was charging $30/ton for using it as daily cover. That use has been discontinued by the landfill, because of concern about future liability. They are requiring additional testing for PFAS, even just to take the material for disposal in the landfill, which would cost $65/ton. In case the landfill decides not to take the material because of PFAS levels (which are actually low and typical of any wastewater solids), the municipality has looked into its only other option, incineration; that would cost $235/ton. In addition to these changed costs, this example municipality would abandon a functional solids management system that cost more than $2 million in recent years. Those costs would be sunk.

As of yet, no NH municipality has had to change their wastewater solids management program. However, some plans for improvements to such programs have been put on hold, pending clarity on the PFAS issue. Using numbers from one facility that produces about 10 wet tons/day of wastewater solids that are currently recycled to soils in a very successful beneficial use program, we estimate that the added net cost to the municipality for solids disposal at a landfill would be $850,000/year for

[6] A typical dilution factor applied for contaminants in effluent is 70, which means effluent below 1400 ppt would be permissible if the MCL were set at 20 ppt.

tipping fees, trucking, and labor (assuming a normal landfill will accept the material, which, again, is not a contaminated solids – it has PFAS levels typical of all domestic wastewater solids). Such large increases in wastewater facility operation costs will require increases in sewer use fees, impacting residents and businesses. And the environmental impacts of that landfill disposal of solids – with greenhouse gas impacts – will be significant. How will DES integrate these costs into its MCL-setting calculations?

Municipal (and private) Solid Waste Management Sites: Landfills, Transfer Stations

Many of the same arguments discussed for wastewater and wastewater solids also apply to municipal solid waste (MSW) management. Municipalities and their waste management systems (wastewater facilities, transfer stations, and landfills) are not *sources* of PFAS. The municipality ends up dealing with an issue imposed on it. As with wastewater, if MSW must be managed differently because of PFAS concerns and possible impacts to drinking water or groundwater exceeding a given MCL, the costs will be large. How will DES integrate these costs in its calculations in the MCL-setting process?

If it is found that a low MCL might require changes in wastewater and MSW management, will the state provide funding? Or will DES create exemptions for such activities or certain situations?

Fire Stations, Schools, & Other Municipal Infrastructure

Because of use in various products, other municipal infrastructure and land may be contaminated with PFAS at levels that threaten groundwater and drinking water. Whether or not this is an issue in just a few or many situations will depend on the MCLs set.

Private Entitites

We have not addressed another set of stakeholders who may bear considerable costs, depending on where the MCLs for these four PFAS are set. Clearly, St. Gobain and other industrial facilities using PFAS chemicals are and will continue to bear significant costs. But there are other entities that may be impacted, such as car washes. Will DES consider these entities when estimating costs in its MCL-setting calculations?

Opportunity Costs

Finally, in cost calculations, DES and the State as a whole should consider alternative uses of the funds expended in chasing lower levels of PFAS in drinking water. This is, unfortunately, a reality that those of us in the municipal and utility sector have to deal with every day. Would the same funds yield higher benefits if they were used to address other public health issues? Even within the drinking water world, are PFAS at levels above 70 ppt or 20 ppt more significant threats than arsenic or lead? And, looking beyond the drinking water world, would the same funds provide greater benefits addressing the opioid crisis or climate change, for example? The DES justification for selected MCLs should include at least a qualitative determination that spending the anticipated funds to protect drinking water to a particular level will produce more benefits from limited public (and private) funds than equal investment in other public health protections.

Feasibility / Practicality

The MCL-setting process, and the New Hampshire law requiring this process, require evaluation of the practicality and feasibility of a particular action. We have concerns about the following:

- Because an MCL automatically becomes a groundwater standard in New Hampshire, it is important to note that still, at this time, there is no EPA-approved method for analysis of PFAS

in any matrix other than drinking water. This includes groundwater, although relatively clean groundwater presents little concern. (Data from testing dirtier groundwater continues to be somewhat suspect and may not be comparable from one lab to another.)

- Detection and reporting limits continue to improve, but remain relatively close to some of the extremely low MCLs that some have proposed, e.g. 1- 10 ppt).
- Because of the ubiquitous dispersion of some PFAS in the environment and their uses in products, cross contamination is a concern.
- A ppt is very small: 1 second in ~31,700 years. It is important to remember that only a few contaminants are regulated at the ppt level, and they are all very unusual, rare contaminants – not like the ubiquitous PFAS.
- For the foreseeable future, there will be significant challenges with sampling, testing, and analysis of PFAS – and DES should recognize this and the costs of these added challenges

We thank you for your consideration of these comments and look forward to the ongoing, challenging process ahead. We thank you for your due diligence and your involvement of stakeholders.

Sincerely,

Ned Beecher
Executive Director

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nebra
North East Biosolids & Residuals Association
Cooperatively promoting the environmentally sound recycling of biosolids and other residuals

New Hampshire Department of Environmental Services
P. O. Box 95
Concord, NH 03302

March 12, 2019

Re: Comments delivered verbally to DES hearing, Portsmouth, March 12, 2019

Thank you to NH DES for the opportunity to provide input on this important topic. This short verbal testimony serves as a placeholder; we will be submitting detailed written comments in April.

I work with a wide variety of public officials who work in the water quality field every day, managing and operating wastewater treatment facilities (WWTFs) and related systems. These employees of public utilities and municipalities are worried about the PFAS issue and how it will impact their systems, programs, and budgets. Some have already seen significant technical and cost impacts, because of the uncertainty around this issue. We / they all are focused on public health and protecting the environment – that's what our work is all about. But we / they have the following concerns that need to be part of the considerations as DES develops MCLs for PFAS in drinking water.

- PFAS are the only common chemicals being regulated in parts per trillion in drinking water. This means that regulatory limits are very close to feasibility limits, since diffuse releases of PFAS are widespread. This requires a very thoughtful, careful balancing act: protecting drinking water – absolutely – but also figuring out how to address all these diffuse, low levels – background levels – in many places.

- Parts per trillion of PFAS are in wastewater and will be for the foreseeable future, because they are in our daily lives.

- How will DES avoid disrupting wastewater treatment - which is critical to public health – as PFAS MCLs are set for drinking water? Wastewater effluent contains PFAS in single to low tens of parts per trillion. DES has not included estimates of costs if all of New Hampshire's WWTFs have to treat for PFAS. Which, by the way, is not currently feasible technically.

- And what about the benefits of setting any particular PFAS MCL levels? The current debate is within the range of 70 ppt for PFOA + PFOS – the EPA health advisory value that DES has been using as an action level – and, say, 20 ppt – the low level set in Vermont. That range represents

a factor of 3.5 (70 / 20). The health risk calculations involve uncertainty factors of more than 100 to 300. So the 3.5 factor being debated in NH and considered by DES is dwarfed by the uncertainty factors already in the health risk calculations. This means that the best a health risk assessor can say is that going from 70 to 20 will reduce health risk somewhat, as will any reduction. But there is no way of saying that there is a measurable benefit. We just don't know. And what we are finding out, as we evaluate this, is that there is likely a large cost and disruption difference in going from 70 to 20 ppt.

- The MCL process, including as defined in the NH 2018 law that instigated this process, requires consideration of health protection and feasibility, costs, and benefits. We are concerned that DES has done only a partial job on evaluating the costs associated with setting PFAS MCLs at their proposed (or lower) levels. And DES, by its own admission, has not completed the formal process of evaluating benefits.

We will address these concerns with more details and recommendations in our written comments.

For now, we encourage everyone to work together with us to understand and figure out how we can protect public health as thoroughly as possible while also not bankrupting public utilities and their ratepayers and municipalities. We need to find a careful balance.

Thank you for this opportunity to comment.

Ned Beecher
Executive Director

The North East Biosolids and Residuals Association (NEBRA) is a 501(c)(3) non-profit professional association advancing the environmentally sound and publicly supported recycling of biosolids and other organic residuals in New England, New York, and eastern Canada. NEBRA membership includes the environmental professionals and organizations that produce, treat, test, consult on, and manage most of the region's biosolids and other large volume recyclable organic residuals. NEBRA is funded by membership fees, donations, and project grants. Its Board of Directors are from CT, MA, ME, NH, VT, and Nova Scotia. NEBRA's financial statements and other information are open for public inspection during normal business hours. For more information: http://www.nebiosolids.org.

BACKGROUND & PROPOSED AGENDA

MEETING – Thursday, April 11, 2019, 10:00 am
NH DES • Concord, NH

PFAS – Municipal Concerns

Clean, safe water is critical to New Hampshire's citizens, businesses, economy, and quality of life. Our organizations (NHWPCA, GSRWA, NHMA, NEBRA) represent hundreds of professionals in the water quality field in New Hampshire (and surrounding states) who work on water quality, drinking water, and wastewater and wastewater residuals (biosolids) management, in both the public and private sectors. Our members are environmental stewards working every day on the front lines to protect public health and the environment. We share NH DES's goals and have long appreciated working with Department staff. We appreciate this opportunity to discuss high-level policy concerns related to PFAS policy and regulation – with the municipal perspective in mind. These policy concerns relate to several NH DES programs in addition to drinking water, including wastewater, septage, energy, biosolids and residuals, and solid waste management.

Proposed Agenda

A. Introductions

- Chip Chesley, Director of General Services, City of Concord
- Dan Driscoll, Superintendent, Concord Hall Street WWTF, City of Concord
- Aaron Costa, Operations Manager of Drinking and Wastewater Treatment Facilities, City of Keene
- Noelle Osborne, Operations Supervisor, City of Nashua WWTF
- Peter Kulbacki, Public Works Director, Town of Hanover
- Phil Maltais, Sewer Superintendent, Town of Seabrook
- Kyle Fox, Public Works Director, Town of Merrimack
- Sarita Croce, Assistant Director of Public Works/Wastewater, Town of Merrimack
- Tim Fortier, NH Municipal Association, Concord
- Jennifer Palmiotto, Executive Director, Granite State Rural Water Association, Walpole
- Shelagh Connelly, President, Resource Management Inc., Holderness, and NHWPCA
- Ned Beecher, Executive Director, North East Biosolids and Residuals Association (NEBRA), Tamworth

B. Where we are with the PFAS issue

We applaud NH DES's proactive actions on addressing the major sources of PFAS (industrial, firefighting, and military sites), including looking at AFFFs and site investigations and remediations. With regard to the myriad *diffuse* releases of PFAS throughout the state, from landfills, some businesses, and wastewater and residuals management – including municipal systems: based on the current level of knowledge, these lower level sources do not appear to be causing significant water contamination at levels relevant to current screening standards. This means there is time to pause and develop a plan, with municipal participation.

C. For discussion:

1. New Hampshire is one of just a few states being proactive in regulating PFAS beyond the guidance and screening values for drinking water provided by U. S. EPA. NH is setting MCLs for 4 PFAS chemicals, and we have comments on that for Friday's deadline. We have already expressed, and will continue to express, concerns about the repercussions of setting MCLs, and other state actions, on municipal operations and budgets. Addressing high drinking water levels around industrial, firefighting, and landfill sites is important. But the uncertainties and emergency actions around PFAS have disrupted some municipal operations, and we want to work with the Department to minimize these disruptions whenever possible, going forward.
2. The MCLs become groundwater standards (AGQS), and DES is required to begin to regulate surface water beginning in January 2020. What are DES's plans for navigating these further actions? How will

the low drinking water enforcement standards impact regulatory standards for other media, such as wastewater and soil? Exemptions seem to be one of DES's answers. But that approach may set unreasonable public expectations. And exemptions leave municipal operations with uncertainty.

3. Instead of relying on exemptions, DES could thoroughly consider benefits, costs, and feasibility in setting MCLs, as the MCL process and SB 309 demands. Higher MCLs may be appropriate and feasible and still be adequately protective of public health (e.g. Canada just finalized 200 and 600 ppt for PFOA and PFOS in drinking water).
4. Municipalities and utilities are concerned about unintended impacts to wastewater and biosolids and residuals management programs. The biosolids land application moratorium in Maine was wrong. The mistake there is not that they required testing and data collection– we support that and have proactively done testing. The mistake was the moratorium, acting without warning, disrupting markets suddenly, creating confusion. Remember that some municipal systems accept sludges/biosolids and septage from other communities; shutting them off because of PFAS will have significant ripple effects. And municipal investments in managing wastewater and biosolids – they are imperiled by uncertainty around PFAS.
5. Policies and actions must be based on the best available science and feasibility, with balance regarding consideration of uncertainty. Municipalities need to be able to plan and phase in new policies and programs. Disruptions of municipal systems can lead to impacts on businesses. Do we want that?

D. Additional details for consideration

1. Think of all the media affected by PFAS: e.g. the Merrimack has low ppt levels of PFAS. What is the Department's view on that? If it's a concern, what will be the impacts of developing regulations for wastewater management?
2. If we interrupt current biosolids management, where will biosolids go? Use of residuals for landfill daily cover and capping are now restricted by a landfill owner in MA because of uncertainty around PFAS. Even in-state landfills are wary about taking PFAS-positive materials (which all biosolids are). What are DES's plans for the possible scenarios if biosolids cannot be recycled?
3. Analysis of PFAS in media other than drinking water remains challenging, given no approved method, method variation between labs, and a lack of screening values for comparing data. Uncertainty exists.
4. A reminder that wastewater treatment & biosolids management and related systems (anaerobic digestion, renewable energy, diverting organics from landfills) are beneficial to public health, communities, farms, and others. These benefits are much greater in magnitude than the perceived public health protection benefit of going from 70 ppt to 30 or 20 ppt in drinking water or restricting land application as we evaluate further.
5. Source reduction is key – and something almost everyone can agree on. What's being done on that?

E. What we ask

All of us want to do the right thing. We need strong leadership. Now that the PFAS emergency is being addressed, we encourage Governor Sununu and DES to:

- Pursue practical solutions-based approaches. PFAS will be in the environment; we have to manage it with carefully planned priorities.
- Continue focus on the large, priority sites and drinking water protection.
- Focus more on reduction of major *sources*. Avoid shifting burdens onto *conveyers* (municipalities).
- Collaboration is key; work with municipalities. They cleaned the Merrimack and other rivers in the past and have a part in any PFAS mitigation now.
- Take time to summarize what has been done and why. Develop a written plan, with municipal representation, for the next stages of living with PFAS. For example, Washington State is developing a thoughtful Chemical Action Plan.
- Communicate clearly to the public the realities of living with PFAS. Articulate the relative risks: PFAS are minor compared to opioids, for example.

Sarah Pillsbury
Groundwater Bureau
New Hampshire Department of Environmental Services
P. O. Box 95
Concord, NH 03302

delivered by email: sarah.pillsbury@des.nh.gov

April 12, 2019

Dear Ms. Pillsbury,

Thank you for the opportunity to provide technical input regarding the work of the Department of Environmental Services (DES) on establishing MCLs for four PFAS chemicals, as required by law (SB 309 of 2018).

These comments are submitted by groups representing those on the front lines of water quality protection in New Hampshire. The members of our organizations are the professional operators and engineers who maintain the water quality of the state. Our missions and goals align closely with those of DES and the broad public interest: to protect water resources throughout the State. Our members strive to always provide our communities with the highest levels of services and protections possible within the constraints of technical feasibility and budgets. But some have already seen significant technical and cost impacts, because of the uncertainty around the PFAS issue.

We believe that the process of setting MCLs to date has failed to address critical information regarding the costs and benefits – or the lack of such information. The following concerns need to be considered as DES continues its work on developing MCLs for PFAS in drinking water. Legislative criteria regarding setting MCLs for PFAS requires DES to:

- *"initiate rulemaking to adopt maximum contaminant levels"*

  There is no deadline for *completing* the setting of MCLs. We believe that rushing this process by inadequately addressing some key requirements of the MCL-setting process is unnecessary. We understand that there is pressure to set these standards sooner rather than later. However, unless DES takes the time to adequately address all comments submitted to date and completes the complicated tasks of generating cost data and a formal calculation of benefits of the proposed MCLs, the proposed regulations will be indefensible and subject to legal challenge.

- *"After consideration of the… costs and benefits to affected parties that will result from establishing the standard"*

  While DES has done excellent, extensive work over the past few years to gain an understanding of PFAS contamination and its extent and implications around the state, **DES has not adequately addressed the cost and benefits associated with the proposed standards.**

The highest-risk sites have been identified and are being addressed. DES actions, which have relied on the EPA public health advisory screening levels of 70 ppt for PFOA + PFOS, have set the stage for the setting of MCLs. Thus, the focus in the current MCL-setting process has been on the range of 70 ppt to perhaps 20 ppt (Vermont's number for 5 PFAS). That range of consideration is narrow. But the potential feasibility and cost implications of where the MCLs end up are considerable. While there seems to be an assumption that MCLs must be at 70 ppt or below, the rationale for that assumption has not been articulated. EPA public health advisories are not MCLs and other jurisdictions have set higher drinking water levels; for example, Canada just finalized 200 ppt for PFOA and 600 ppt for PFOS as screening levels in drinking water for health protection.

To summarize, while three of the criteria set forth in SB 309 for the MCL-setting process have been adequately addressed (*occurrence in drinking water, the ability to detect the contaminant, and the ability to remove the contaminant from drinking water to achieve compliance with the MCLs)* **the critically important "*costs and benefits to parties affected by establishing the standards*" have not been adequately addressed.**

Given our concerns, we strongly recommend that DES not propose final MCLs for PFOA, PFOS, PFHxS, and PFNA until the following steps are completed, in accordance with statutory requirements:

- Complete the cost analyses required, engaging external experts as needed.
- Complete the benefits analyses required, engaging external experts as needed.
- Provide reports on the cost and benefits analyses to stakeholders for review and comment.

Once the required analyses of costs and benefits have been completed, that information should be integrated into revised, proposed MCLs. Those new proposed MCLs along with the justification based on the cost and benefit information, should then be reported to stakeholders and the public for review and public comment.

Why is this important? From the municipal perspective, we have seen already, and can foresee, that where the MCLs are set for PFAS chemicals has a significant potential for impacting municipal systems, including wastewater treatment, biosolids management, solid waste management, and local landfill monitoring. If municipal systems must make upgrades or require source reductions by local businesses to meet the new MCLs/AGQS, the costs involved will not only be financial burdens on municipalities, but may well affect local businesses, potentially negatively impacting the business climate in the state. There needs to be compelling evidence – from a thorough benefit analysis – to justify such costs.

Finally, MCLs set at levels that result in significant costs to municipalities, need to address the question of where funding for compliance will come from. Our concerns regarding violation of the unfunded mandate provisions of Part I, Article 28-a of the New Hampshire Constitution and RSA 541-A:25 are valid. The costs to municipalities depend entirely on whether those MCLs are set in the current 70 ppt screening level range, at lower levels, or at levels such as those adopted for drinking water in Canada (200 ppt for PFOA and 600 ppt for PFOS).

While raising concerns about the lack of cost/benefit analysis in the MCL setting process so far, we want to commend DES management and staff for their extensive work over the past several years in grappling with a very challenging emerging contaminant issue, under considerable public and legislative pressure, with limited resources. DES has done fine work in addressing the most significant risks of elevated levels of PFAS in drinking waters caused by large releases of PFAS from firefighting-related activities and major industrial uses of PFAS. However, even as those efforts continue to reduce the most significant risk situation, we need to grapple with the reality of lower levels of PFAS in myriad places around the state. These diffuse PFAS do not present the same level of risk and should not be addressed with the same mode of intervention.

A long-term management plan for PFAS in the environment needs to be developed and should include extensive municipal involvement, since municipalities will be front and center in addressing the myriad lower levels of PFAS that are inevitably found in wastewater, septage, biosolids, solid waste, and around closed municipal landfills. The state should partner with municipalities when setting these standards to strike the right balance between the standard and funding for compliance.

Thank you for this opportunity to comment.

Sincerely,

Barbara T. Reid, Government Finance Advisor
New Hampshire Municipal Association (NHMA)

Ned Beecher, Executive Director
North East Biosolids and Residuals Association (NEBRA)

Jennifer Palmiotto, Executive Director
Granite State Rural Water Association

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Cooperatively promoting the environmentally sound recycling of biosolids and other residuals

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April 12, 2019

Further Independent Comments to
the New Hampshire Department of Environmental Services
on Proposed Maximum Contaminant Levels (MCLs) and Groundwater Standards Proposed for PFAS

We respectfully submits these comments to the New Hampshire Department of Environmental Services (DES) for its consideration regarding the establishment of drinking water and groundwater standards for per- and polyfluoroalkyl substances (PFAS). We recognize and support DES's responsible actions to protect public health and the environment, and we applaud the focus and attention DES has dedicated to this issue. We also recognize the concerns of municipalities regarding the potentially high costs of meeting low concentration standards for PFAS, especially if these standards prove to be more stringent than the levels necessary to protect public health, as supported by existing toxicological and epidemiological data. It is thus imperative, from our perspective, that DES set maximum contaminant levels (MCLs) for PFAS at levels that: (i) reflect scientifically sound estimates of adverse health effects based on a holistic analysis of available data, and (ii) balance the costs and benefits of establishing and enforcing the MCLs and resulting ambient groundwater quality standards (AGQS).

Comment 1: Use of the Minnesota Department of Health (MDOH) Study
DES posted notice on February 21, 2019 that it is considering revisions to its proposed MCLs for PFOA and PFOS based on a study published by researchers at the Minnesota Department of Health (https://www4.des.state.nh.us/nh-pfas-investigation/?p=945). Lacking specifics on how DES proposes to use the information in this study, we cannot evaluate any proposed changes to DES's proposed MCLs. *We thus request that DES release the details of any new proposed MCL levels and allow for additional public comment prior to establishing MCLs for these compounds.*

Pending examination of these details, however, we offer the following observations on the MDOH study. The Goeden et al. (2019) paper focuses on PFOA only, and concludes with the derivation of a Health-Based Guidance Value (HBGV) of 35 ng/l for PFOA alone – essentially the same value as the MCL of 38 ng/l proposed for PFOA.

The DES notice, however, states that "… health-based drinking water or groundwater standards for PFOA and PFOS would potentially be lowered significantly below the initial proposal figures of 38 parts per trillion (ppt) and 70 ppt, respectively." This statement suggests that DES is considering application of the MDOH study in a manner that deviates from the published study. If our understanding is not consistent with DES' plans, then we recommend that DES provide clarification. If DES is planning alternative application of the MDOH study, we caution against an independent evaluation of this sort. As pointed out by DES, the MDOH study is a peer-reviewed publication based on s study of PFOA in a strain of laboratory mice that, compared to other mouse strains or other laboratory animals, are poor models for humans with regard to developmental effects. . Extracting individual aspects of the study could be inappropriate, as the balance of the derivation of the 35 ng/l HBGV depends on numerous simultaneous assumptions, and inconsistencies could result from mixing and matching model components. For example, the relationship between PFAS serum concentrations between the mother and fetus might depend on pharmacokinetic assumptions that differ from and conflict with assumptions that have been made by DES. We thus encourage DES to contact the researchers to discuss all of the assumptions that went into the model for deriving the HBGV, and how the assumptions combine and interact. MDOH has been researching PFAS impacts and health effects since 2002, and their 17 years of experience and perspective could provide valuable assistance and feedback with respect to its published model and views on the manner in which it should be applied.

Comment 2: DES should emphasize its selection of protective studies as the basis of its PFAS MCLs

DES bases its reference dose (RfD) derivations for each of the four PFAS on toxicological studies that involve transient effects. Many toxicologists consider the types of effects chosen by DES as overly protective with respect to establishing RfDs, since RfDs incorporate additional factors of safety and are better based on adverse effects that are both clinically significant and irreversible. As an example, in commenting on the RfD first proposed by the U.S. Environmental Protection Agency (U.S. EPA) in its 2014 Health Assessment Document for PFAS, peer reviewer Dr. James Bruckner stated with respect to increased liver weight (the effect proposed for two of DES's RfDs):[1]

> "I do have a real problem with the scientific basis and soundness of certain conclusions in the document. The primary effect of PFOA in different species is increased absolute and/or relative liver weight. These are quite modest, reversible, non-specific effects that usually are not considered toxicologically significant. Livers of mice and rats dosed with PFOA typically exhibited hypertrophy characterized by increased peroxisomes, numerous mitochondria, reduced rough endoplasmic reticulum (RER), proliferation of smooth endoplasmic reticulum (SER), and increased autophagosomes or lipid-like droplets. Such morphological changes, particularly those in RER and SER, are manifestations of microsomal enzyme induction. This is considered adaptive, rather than adverse. Hall et al. (2012) points out that activation of a

[1] EPA Response to External Peer Review Comments on EPA Draft Documents: Health Effects Support Document for Perfluorooctanoic Acid (PFOA) and Health Effects Support Document for Perfluorooctane Sulfonate (PFOS), May 2016. https://www.epa.gov/sites/production/files/2016-05/documents/response_to_pfoa_pfos_peer_review_comments_508.pdf

battery of genes involved in xenobiotic metabolism and transport serve to maintain homeostasis by enhancing the systemic elimination of the foreign chemical. Although PFOA is very poorly metabolized, it does persistently induce microsomal enzymes and the accompanying hepatocellular morphological changes. Upregulation of genes responsible for biliary excretion may be beneficial, since excretion of bilirubin, bile acids and conjugates of toxic chemicals/metabolites would be enhanced."

Given this perspective, we encourage DES to communicate and emphasize the point to the public that the choices made for RfDs are health protective – perhaps overly so and should emphasize that they are based on the reversible effect of liver enlargement, and not on adverse effects of clear clinical significance.

We also note that DES is acting more protectively than the U.S. EPA with respect to its interpretation of the Luebker *et al*. (2005) toxicity study. DES uses this study to derive an RfD for PFOS of 8 ng/kg-d. The U.S. EPA derives a higher reference dose of 20 ng/kg-d from this same study (which also involves reversible effects). This is another instance of DES being even more protective than the U.S. EPA, a point that should be emphasized in public communications.

Comment 3: DES should acknowledge the health protective nature of the U.S. EPA Lifetime Health Advisory for PFOA and PFOS

In addition to its derivation of four PFAS MCLs, DES also proposes to adopt the U.S. EPA Lifetime Health Advisory (LHA) of 70 parts per trillion (ppt) for the sum of PFOA and PFOS as an MCL. As pointed out above, DES is in some cases being even more health protective with respect to its MCL derivations than the U.S. EPA in its derivation of the LHA. However, there is a considerable degree of health protectiveness built into the U.S. EPA's LHA as well, and from the standpoint of risk communication, the factors that make the LHA protective should be emphasized to the public:

- The underlying RfD is based on a reproductive and developmental study in which observed effects in mice (delayed ossification of phalanges and hastened puberty in male pups) were transient (Luebker *et al*., 2005);

- Developmental health effects were not found to be linked to PFOA in the C8 Studies (the most comprehensive epidemiological studies conducted to date, on people exposed to high levels of PFOA in their drinking water). Specifically, these studies found no associations between exposures to PFOA (whether measured in water or assessed according to concentrations in people's blood) and rates of birth defects, miscarriages, stillbirths, and/or preterm/low birth weight;

- By standard convention, U.S. EPA used the default assumption that humans are potentially more sensitive to PFAS than laboratory rodents (despite evidence and expectations to the contrary), and they apply a factor of safety to account for this possibility. While this is standard "default" procedure for PFAS, data indicate the opposite. Evidence related to PFAS effects mediated via the PPAR- alpha receptor (which effects include actions on the liver and on development) indicates that rats and mice are more sensitive than are humans and other primates. Despite this evidence, the RfD incorporates a safety factor for interspecies extrapolation that assumes the opposite (i.e., that humans are *more* susceptible than "wild type" laboratory mice);

- The assumed drinking water ingestion rate is 0.054 liters per kilogram body weight per day (L/kg-d), a value about twice as large as 0.029 l/kg-d ingestion rate typically used to derive MCLs and

health advisories.[2] The higher ingestion rate is based on the 90th upper percentile level of water ingestion by a nursing mother. As DES has proposed to adopt a similar assumption in its proposed PFOS MCL, it should evaluate whether the transfer of PFAS to the infant during nursing is similar in exposure characteristics to the pre-natal exposure that is implicit in the rodent toxicity studies in which PFAS is administered (by oral gavage) to the dams. Such an evaluation might entail a detailed examination of the MDOH model, with a subsequent detailed analysis made available for peer review and public comment.

- Non-drinking water exposures are assumed to account for 80% of the RfD, even though the most recent measured PFAS concentrations in blood-serum indicate declining and much lower background exposure rates to PFOA, PFOS, and other "legacy" PFAS. This U.S. EPA assumption regarding background PFAS exposure allows only 20% of the RfD to be allocated to the drinking water pathway as the Relative Source Contribution (RSC). DES has derived lower PFAS background exposure in its MCL derivations, but (as illustrated in the next comment) these RSCs also overstate the contributions of background exposure to PFAS. If PFAS exposure from non-drinking water exposure pathways is assumed to be a more realistic but still upper percentile 10% of the EPA RfD of 20 ng/kg-d (providing an allowable RSC of 90%), then the U.S. EPA LHA would increase to approximately 300 ppt based on 0.054 L/kg-d of water ingestion, and approximately 600 ppt if the water ingestion rate is assumed at the default value of 0.029 L/d routinely used for other LHAs and federal MCLs. These points are worthy of communication to the public to demonstrate the protective nature of the U.S. EPA LHA.

- Use of higher RfDs potentially applicable to more serious health effects would also translate to higher levels of presumed safe exposure via drinking water. U.S. EPA could have justified selecting a "point of departure" of 150 ng/kg-d based on hepatic necrosis in rodent studies (as opposed to the 20 ng/kg-d value that was selected).[3]

Comment 4: The Relative Source Contributions for PFAS are underestimated

While we typically agree that the use of local data is best, it is technically incorrect to use PFAS serum concentrations from Southern New Hampshire and the Pease exposure groups in deriving RSC values. RSCs are used to account for PFAS exposure from pathways other than drinking water (e.g., diet, ingestion of dust, etc.). The Southern New Hampshire and Pease exposure groups are known to have been exposed to elevated levels of PFAS in drinking water, and hence drinking water is contributing to, and likely dominating, their overall exposure to PFAS. They consequently are not an appropriate choice for characterizing PFAS background exposure, and hence RSCs.

At a minimum, DES should revert to the use of the National Health and Nutrition Examination Survey (NHANES) serum concentration data. These data are already documented in the Summary Report. If based on the 95th percentile serum concentrations, and using DES's target serum concentrations, RSC values, calculated as:

RSC = (Target Serum Level – Background exposure level) ÷ Target Serum Level

should be revised to the following:

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[2] 0.029 l/kg-d = 2 L/d of water consumption by a 70 kg individual.

[3] Of the candidate RfDs considered by EPA (as summarized in Table 5-2 of each of the drinking water health advisory documents for PFOA [EPA 822-R-16-005] and PFOS [EPA 822-R-16-004]), only the RfD of 150 ng/kg-d indicates a damage-based observation (liver necrosis). All other candidate RfDs reflect differences in body or organ weight, metabolic indicators, or transient developmental effects.

- PFOA: RSC = (43.5 ng/mL – 5.6 ng/mL) ÷ 43.5 ng/mL = 0.87 = 87%
- PFOS: RSC = (62.2 ng/mL – 18.5 ng/mL) ÷ 62.2 ng/mL = 0.70 = 70%
- PFHxS: RSC = (90.7 ng/mL – 5.6 ng/mL) ÷ 90.7 ng/mL = 0.94 = 94%
- PFNA: RSC = (16.3 ng/mL – 2.0 ng/mL) ÷ 16.3 ng/mL = 0.88 = 88%

Moreover, time trend analysis of the NHANES serum concentration data indicates that these RSC values are underestimated. The blood serum method used by DES implicitly assumes that PFAS levels in humans are at steady-state, but in actuality, the NHANES data indicate that Americans are at present excreting more PFOA, PFOS, PFHxS, and PFNA than they are taking in. Better estimates of PFAS RSCs can be calculated using the NHANES time trend data and other parameters documented by DES.

The Agency for Toxic Substances and Disease Registry (ATSDR) provides a framework for estimating background exposure to PFAS based on the observation that concentrations of many PFAS have been decreasing in blood in the general U.S. population.[4] Heuristically:

Rate change in PFAS body burden = Background intake rate of PFAS – PFAS excretion rate

Adapting the nomenclature in Appendix A of the ATSDR Toxicological Profile, and assuming (as does ATSDR) 100% absorption of PFAS intake exposure:

$$\frac{d}{dt}(C_b V_d) = D_{back} - k_e C_b V_d$$

$$k_e = \frac{\ln(2)}{t_{1/2}}$$

where the terms are:

C_b	Arithmetic average concentration of PFAS in serum (blood) (ng/l);
V_d	Apparent volume of PFAS distribution (l/kg);
D_{back}	Background exposure to PFAS (ng/kg-d);
k_e	PFAS elimination constant (d^{-1}); and
$t_{1/2}$	PFAS half-life in the body (d).

PFAS concentrations have been measured in blood in the general U.S. population over several periods as part of the NHANES, the earliest in 1999, and the latest in 2013 (https://www.atsdr.cdc.gov/pfas/pfas-blood-testing.html). Assuming (1) PFAS concentrations in blood of C_{b1999} and C_{b2013} in the earliest and latest periods, (2) independence between the variables C_b and V_d, and (3) constant background exposure to PFAS over the period of exposure (T = 14 yrs = 5133.5 d),[5] the differential equation can be solved and rearranged to yield the following expression for estimating the background exposure D_{back}:

[4] The fact that serum levels of many PFAS are decreasing in the general U.S. population is an important point worthy of greater emphasis in the face of growing concerns over adverse health effects. We recommend the incorporation of graphics similar to Figure 1 and Figure 2 within the ATSDR report, along with additional discussion of the declining trends.

[5] The pattern of serum PFNA does not indicate a steady decline since 1999, but rather an increase from 1999 through 2009, followed by a subsequent decline. The equation to consider background is thus considered over the period from 2009 to 2013 for PFNA.

$$D_{back} = \frac{k_e V_d (C_{b2013} - C_{b1999} e^{-k_e T})}{1 - e^{-k_e T}}$$

We apply this equation to the four PFAS for which DES has proposed MCLs (PFOA, PFOS, PFHxS, and PFNA). Arithmetic average serum PFAS concentrations, which are appropriate for the model, are not directly available from ATSDR in the draft toxicity profile. As such, the values of the 50th, 75th, 90th, and 95th percentile levels have been extracted from CDC (2018), curve-fit to estimate parameters for assumed log-normal distributions, and the parameters have been used to estimate arithmetic means. A spreadsheet with the calculations to estimate these values is provided as an attachment to our comments.

Applying the following parameters for PFOA:

C_{b1999}	5,625 ng/l (estimated arithmetic mean, U.S. residents, 1999-2000);
C_{b2013}	2,337 ng/l (estimated arithmetic mean, U.S. residents, 2013-2014);
V_d	0.17 l/kg (DES);
$t_{1/2}$	2.7 yr = 985.5 d (DES); and
T	5133.5 d (14 years)

yields a background PFOA dose estimate of 0.268 ng/kg-d.

Applying the following parameters for PFOS:

C_{b1999}	33,405 ng/l (estimated arithmetic mean, U.S. residents, 1999-2000);
C_{b2013}	6,408 ng/l (estimated arithmetic mean, U.S. residents, 2013-2014);
V_d	0.23 l/kg (DES);
$t_{1/2}$	3.4 yr = 1,241 d (DES); and
T	5133.5 d (14 years)

yields a background PFOS dose-estimate of 0.612 ng/kg-d.

Added together, PFOA and PFOS background exposure are predicted to be 0.88 ng/kg-d, or 4.4% of EPA's reference dose of 20 ng/kg-d for the sum of PFOA and PFOS.

Similar estimates can be developed for PFHxS and PFNA using the blood serum data and parameters reported by ATSDR. However, unlike PFOA and PFOS, concentrations of PFHxS and PFNA (Figure 1) have not declined as rapidly in blood as those of PFOA and PFOS (Figure 2). In fact, from 1999 to 2009, concentrations of PFNA increased (Figure 1).

Applying the following parameters for PFHxS:

C_{b1999}	2,645 ng/l (estimated arithmetic mean, U.S. residents,1999-2000);
C_{b2013}	1,350 ng/l (estimated arithmetic mean, U.S. residents, 2013-2014);
V_d	0. 287 l/kg (DES);
$t_{1/2}$	5.3 yr = 1934.5 d (DES); and
T	5133.5 d (14 years)

yields a background PFHxS dose estimate of 0.167 ng/kg-d.

Applying the following parameters for PFNA, but adjusting the equation to cover only the recent decay period from 2009 to 2013:

C_{b2009}	1,418 ng/l (estimated arithmetic mean, U.S. residents, 2009-2010);
C_{b2013}	801 ng/l (estimated arithmetic mean, U.S. residents, 2013-2014);
V_d	0. 2 l/kg (DES);
$t_{1/2}$	2.5 yr = 912.5 d (DES); and
T	1461 d (4 years)

yields a background PFNA dose estimate of 0.0757 ng/kg-d.

A more complex analysis that considers time-varying background and other factors, or a sensitivity study could be constructed to test the variability introduced by different parameter choices. But barring extreme changes in parameter values, large differences in estimated background exposure estimates are not likely. For the four PFAS considered, the inferred background exposure rates are all relatively small fractions of the RfDs derived/proposed by DES:

- PFOA: Background/RfD = 0.268 ng/kg-d ÷ 5.2 ng/kg-d = 5% (RSC = 95%);
- PFOS: Background/RfD = 0.612 ng/kg-d ÷ 8 ng/kg-d = 68% (RSC = 92%);
- PFHxS: Background/RfD = 0.167 ng/kg-d ÷ 9.3 ng/kg-d = 2% (RSC = 98%); and
- PFNA: Background/RfD = 0.0757 ng/kg-d ÷ 2.5 ng/kg-d = 3% (RSC = 97%).

Based on the above values, assigning an RSC of 90% for these PFAS would be a health protective assumption.

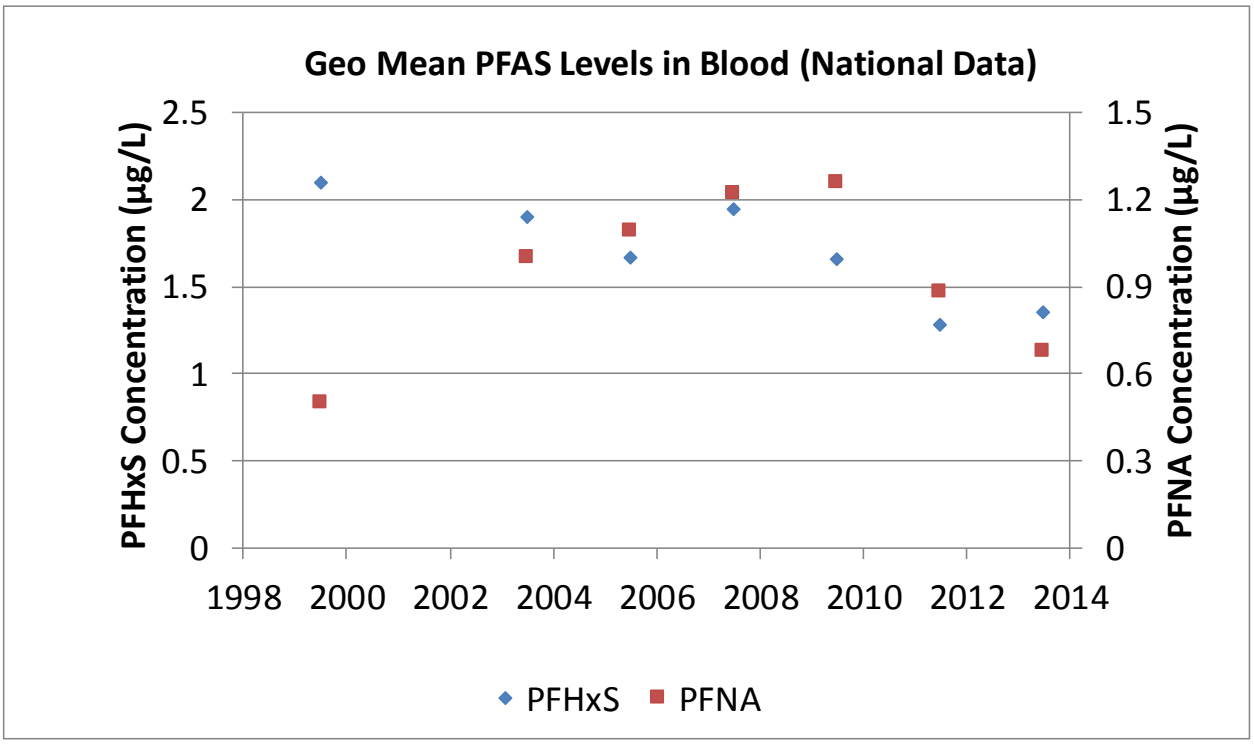

Figure 1 Geometric mean concentrations of serum PFHxS and PFNA reported for the U.S. population, from Table 5-22 of the draft ATSDR Toxicity Profiles

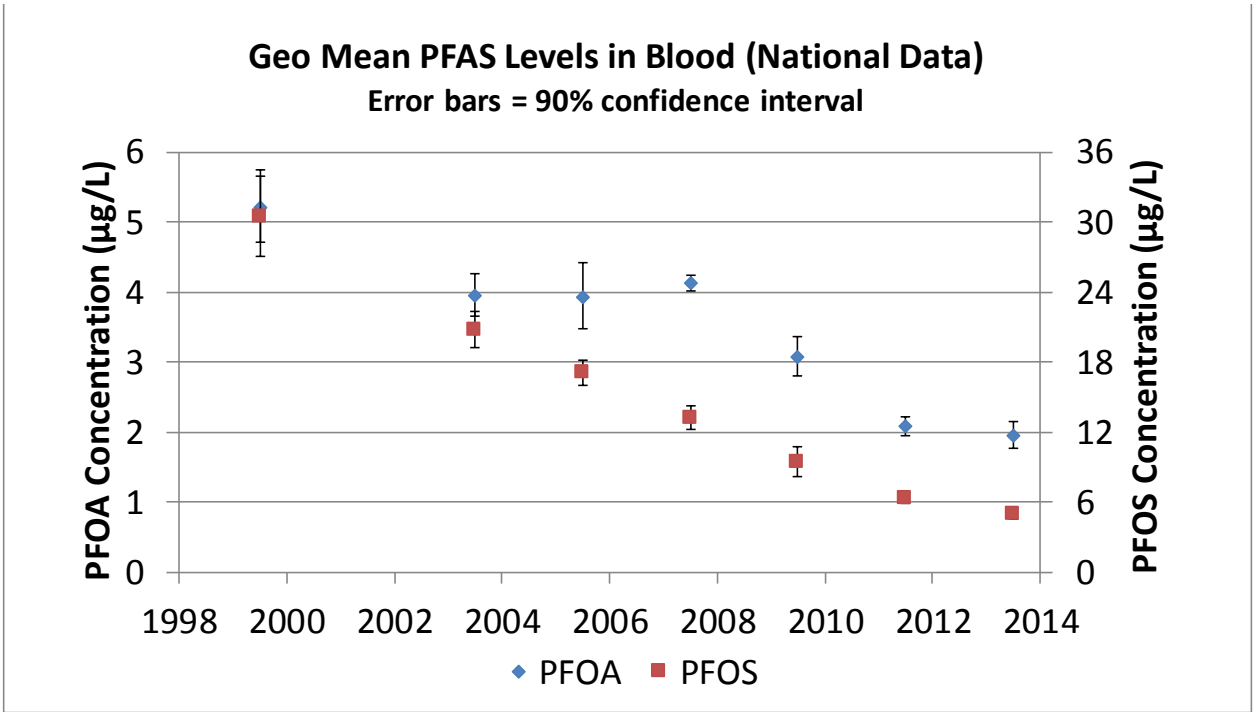

Figure 2 Geometric mean concentrations of serum PFOA and PFOS reported for the U.S. population, from Table 5-21 of the draft ATSDR Toxicity Profiles. Bars represent the 5th and 95th percentile concentrations, obtained from the more detailed NHANES data available online.

Comment 5: DES can derive some scientifically-defensible estimates of health benefits (avoided costs) of achieving PFAS MCLs

We acknowledge that estimating the benefits of reducing PFAS levels in drinking water is a challenging task. Though heuristically simple in concept, determining dose-response functions and assigning monetary values to avoided diseases, developmental effects, and potential adverse health outcomes is difficult for PFAS.

DES claims that it is not possible to estimate monetary values for health benefits, but claims that such benefits are likely substantial. If, as some believe, PFAS are not causing any health effects at anticipated environmental levels of exposure, the actual benefits might be zero (a point that DES should acknowledge). This leaves one with the unsatisfying range of zero to substantial.

We do note that the contingent valuation method that DES has investigated is not a measure of health benefits, but rather a measure of what people are willing to pay for reducing the concentrations of PFAS in their drinking water. Contingent valuation must be done carefully, as it could overestimate value. When asked what they are willing to pay for a hypothetical change, people may provide higher monetary values that they are in practice actually willing to pay. There might be some empirical data to be gained in this matter in the Merrimack area, as the costs of a recently proposed treatment system are expected to roughly double the cost of publicly supplied water. Will the residents willingly pay for these increases, or will they seek other funding sources for the upgrades?

Turning back to health benefits, DES can in fact perform some quantitative valuation with respect to potential cancer impacts (potentially important, as cancer is a frequent concern expressed by the public). Assuming (based on equivocal evidence) that PFAS exposure causes cancer, the following

approach can be implemented to estimate the monetary value of the cancers that could be prevented by lowering PFAS concentrations in drinking water statewide.

As a hypothetical example, assume that all PFAS exposure through drinking water could be eliminated, *i.e.*, the concentrations of PFAS in all drinking water sources could be reduced to zero. In that case, the economic benefit could be calculated as the cost associated with cancers caused by PFAS at levels currently present in drinking water. Using the following assumptions:

- A population-weighted average PFAS concentration of 20 ng/L in drinking water;[6]
- NH's 2019 population of 1.36×10^6 people;
- 2 L/d of drinking water consumed by each person of 70 kg average weight over an entire lifetime;
- EPA's estimate of cancer potency slope factor for PFOA of 0.07 kg-d/mg (the value provided in EPA's 2016 *Health Effects Summary Document*, and assuming it applies to all PFAS);
- An average human lifetime of 75 years;
- All PFAS-related cancers are fatal; and
- An economic value of $8,800,000 for a human life (a typical figure assumed by EPA in cost-benefit analyses pursuant to Clean Air Act regulations);

an estimated upper-end economic benefit value of $6,400 per year is calculated for the reduction from eliminating all PFAS from drinking water:

$$\text{Benefit} = \left(\frac{2\,\text{l/d} \times 20\,\text{ng/l}}{70\,\text{kg} \times 10^6\text{ng/mg}}\right) \times \left(0.07\ \frac{\text{kg-d}}{\text{mg}}\right) \times (\$8.8\times10^6) \times (1.36\times10^6) \div 75\ \text{yrs} = \$6{,}400\ \text{per yr}$$

Consideration of less than complete reductions in PFAS concentrations (*i.e.*, MCLs >0), less than lifetime exposure periods, and the fraction of cancers likely to be non-fatal will all lead to smaller economic benefit.

It should be noted that the incremental lifetime cancer risk (ILCR) estimate, as set forth in the first portion of the above equation, is 4×10^{-8}, or 4 per 100 million, which is well below the *de minimus* 1 per million (1×10^{-6}) ILCR used in the Superfund program to identify potentially significant risks. If all of the 1.36 million residents of New Hampshire each incurred this 4×10^{-8} excess lifetime risk, there would be about a 5% chance of one individual in the current population within the state developing a case of cancer caused by PFAS (based on the aforementioned assumptions), or about one cancer every 1,380 years in the whole of New Hampshire.[7] Since the U.S. EPA potency slope estimate is an upper bound estimate, these values are all overestimates of actual risks.

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[6] A "ballpark" average concentration of PFOA+PFOS in NH public water supplies is estimated to be about 10 ng/l based on values presented by DES in a May 17, 2018 meeting, assuming 100 ng/l for values >70 ng/l, 5 ng/l for values <10 ng/l, and ignoring UCMR3 non-detects at elevated detection limits. Allowing for PFHxS and PFNA at a similar level provides an average estimate of 20 ng/l for the four PFAS.

[7] This simplified example does not take into account factors such as childhood exposure or potential variations over time (*e.g.*, possible decreases in concentrations of PFAS in drinking water in the future), but in an order of magnitude sense, does indicate a likelihood that PFAS exposure may cause no additional cancers in the New Hampshire population, based on current toxicity information.

Comment 6: Drinking water ingestion rates should match the nature of toxicity studies
DES selected the drinking water ingestion rate of 0.055 l/kg as appropriate for a nursing mother (who by necessity consumes a higher volume of fluids). Use of this higher rate is arguably appropriate for use in the derivation of the PFOS MCL, which is based on a developmental toxicity study. However, the proposed MCLs for PFOA, PFHxS, and PFNA are based on toxicity studies that are consistent with a normal or typical rate of water ingestion. We suggest that DES revise the water ingestion rate to 0.029 l/kg for the PFOA, PFHxS, and PFNA derivations (which corresponds to the U.S. EPA's default MCL assumptions of 2 l/d of water consumption by a 70 kg individual).

Thank you for the opportunity to provide comments. We look forward to further collaboration in this process. As noted in our joint comments with others, we encourage DES to carefully consider and respond to comments, integrate them with work the Department has conducted since the original proposal was offered, and report to the public and stakeholders a further proposal, with added cost and benefit analysis, to complete the required work, in accordance the Legislature's intent. Such a process will ensure that DES completes the MCL-setting process with the same diligence and scientific process that it completed for many of the requirements in the its original proposal.

Sincerely,

Ned Beecher, Executive Director
North East Biosolids and Residuals Association (NEBRA)

The North East Biosolids and Residuals Association (NEBRA) is a 501(c)(3) non-profit professional association advancing the environmentally sound and publicly supported recycling of biosolids and other organic residuals in New England, New York, and eastern Canada. NEBRA membership includes the environmental professionals and organizations that produce, treat, test, consult on, and manage most of the region's biosolids and other large volume

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North East Biosolids & Residuals Association

Cooperatively promoting the environmentally sound recycling of biosolids and other residuals

Representative William Hatch, Chair
Joint Legislative Committee on Administrative Rules
Office of Legislative Services
25 Capitol Street, Room 219
Concord, NH 03301-6312

July 8, 2019

Dear Representative Hatch and Members of the Committee,

I am writing to request that the Joint Legislative Committee on Administrative Rules (JLCAR) postpone consideration of the rules submitted by the Department of Environmental Services (DES) related to establishing standards for drinking water and groundwater for PFAS chemicals, specifically, rules related to:

- Env-Dw 700 & 800 (FP 2019-16), establishing maximum contaminant levels (MCLs) for four PFAS;
- Env-Or 603.03 (FP 2019-15), establishing ambient groundwater quality standards (AGQS), for the four PFAS; and
- Env-Wq 402 (FP 2019-14), establishing water quality standards and procedures for discharges to groundwater of wastewater containing any of the four PFAS.

We applaud DES for addressing the PFAS issue and for all the scientific investigations they have carried out over the past three years. We strongly support protection of public health – it is what we do on the ground every day, as water quality professionals.

But we are concerned about the implications of the proposed DES PFAS MCL regulations. As we stated in comments to DES, if low numerical standards are absolutely needed for public health protection, then we all need to recognize and forthrightly address the fact that they could dramatically disrupt wastewater, septage, and biosolids (and other) operations throughout the state and impose significant, unexpected costs on public utilities, municipalities, and other stakeholders. We have not seen plans to address this from DES. Instead, we have just received the new proposed MCLs for four PFAS in the past week – and our concerns are heightened. These MCLs would be the only such formal, enforceable standards in the U. S. (other than one number in New Jersey). This is a big step that no other state has taken, despite years of discussion and pressure on some of them. The cost implications are large when going from DES's current *de facto* enforcement value of 70 parts per trillion (ppt) for PFOA + PFOS to the proposed standards in the teens of ppt. Routine municipal waste management activities – including septic systems, septage and biosolids management, wastewater treatment, and landfills – critical public health functions – will be impacted with hundreds of millions of dollars of unanticipated costs in the next few years. If this is necessary to protect public health, then so be it. But the money has to come from somewhere, and DES has not done what was required of it and identified all the costs of its proposed rules, nor proposed a plan for where the money will come from.

Given the serious cost implications, we all need to work together to understand the impacts and ensure these rules get it right. Otherwise, we will be irresponsibly spending ratepayer and taxpayer money.

We urge the Committee to delay formal review of these DES rules for the following reasons:

- These final proposed PFAS MCL rules and their justification are significantly different than DES's initial proposal (DES, *Summary Report*…, Jan 4, 2019). They have had no public or independent peer review (other than one by a DES-contracted expert from Univ. of Florida who worked for DES on the proposed rule and is, therefore, arguably not independent). The significant new modeling approach used by DES has not been used by any other regulatory agency except Minnesota, where it was developed, and is not reviewed and approved by U. S. EPA. And the standards DES proposes are significantly lower than equivalent values set by Minnesota using the same model. In addition, we have already identified a faulty assumption in the calculations in this new modeling that, if corrected, would result in MCLs nearly double the proposed values.
- DES released the proposed final rules on the Friday before the July 4th holiday week. DES will be providing further information at a July 9th stakeholder meeting, and municipal stakeholders will be hearing from DES on July 15th regarding the Department's plans for implementation. The JLCAR meeting is July 18th. This short time frame for review of such a major proposed rule change is untenable.
- We believe that the current proposed rules and the process by which they were developed breach JlCAR's rules, justifying a JLCAR objection, including, most significantly, the proposed rules having "a substantial economic impact not recognized in the fiscal impact statement." The proposed rules, while important for public health protection related to the narrow scope of PFAS, may also not "be in the public interest" and may be "beyond the authority of the agency" and "contrary to the intent of the legislature" because of unintended consequences of disruptions and costs to other vital public health and environmental programs.

The cost question is important. But it is hard to argue, because some people interpret our raising it as meaning we are against public health. Not so. Our members are the ones who actually implement public health related to water quality. Even DES seems to dismiss the cost issue by arguing that any costs related to establishing the standards in the proposed rules are attributable to the Legislature and the law of 2018 (SB 309) that required DES to "initiate rulemaking… to adopt a maximum contaminant level" for four specific PFAS chemicals by January 1, 2019. (Note that the law is mute on when the final MCLs must be in place.) The law requires consideration of various factors, including feasibility and "costs and benefits to affected parties." But, as we have stated previously in comments to DES, the Legislature and *the law did not specify at what level the MCLs be set*. If DES were proposing MCLs similar to those, for example, recently adopted in Canada (200 ppt for PFOA and 600 ppt for PFOS), then the compliance costs for municipalities, utilities, and other stakeholders would be dramatically lower - reasonable and moderate. It is DES's decision to set unprecedentedly low MCLs that is causing the dramatic cost implications – costs that DES itself has estimated at up to $267 million over the first year or two.

Traditionally, the formal MCL-setting process takes health-based target values (MCL goals, or MCLGs) and adjusts the final MCLs based on feasibility and costs – a balanced approach. The rationale for this is that health-based value goals involve layers of conservative assumptions and application of uncertainty factors. The exact number at which health impacts are certain is unknowable. In comparison, spending $267 million in the next two years on addressing PFAS likely means that some other important public health needs will not be addressed. While considering costs and benefits seems insensitive when people have contaminated wells and are legitimately worried, balancing public health needs in a world of limited resources is a reality that you and DES have to deal with.

And DES's $267 million estimate is inadequate, as it does not take into consideration full cost impacts on all wastewater treatment systems – including the management of biosolids, septage, and other residuals – that will be borne by both public and private entities. And there is no mention in DES's report regarding costs to "responsible parties" for PFAS contamination, which include not only cleanup and remediation costs, but also loss of income, legal fees, insurance costs, etc. Who are these responsible parties? The state has sued several, including 3M and Chemours. But that is not who we are talking about here. We are talking about NH businesses. Already, in one recent specific PFAS enforcement action, DES has imposed tens of thousands of dollars of cost on a small business

that managed routine, ordinary septage for several decades – a service fully permitted by DES and benefitting the public good - in the same way public wastewater treatment serves the public good. DES has identified that NH family business as a "responsible party." Where is the fairness of putting a private company out of business for a broad, societal mistake (using PFOA and PFOS)? When asked who else may be seen as "responsible parties," DES has stated that municipalities and utilities and the entities with whom they contract for supportive services will be held liable as "responsible parties," just like Dupont and 3M – except DES expects the local "responsible parties" to pay right away, whereas it will take as much as 10 years for those ultimately responsible – those manufacturers – to pay (and only if the state's suit is successful). With such low proposed MCLs and the ubiquitous nature of PFAS in our daily living environments, many small businesses and even individual homeowners may be identified as "responsible parties" and charged with cleanup costs. While DES may not intend this, they have set a precedent now that may lead to neighbors suing neighbors over PFAS. Has this been adequately thought out?

For the above reasons, we urge JLCAR to postpone consideration of the PFAS MCL rules. More consideration and discussion are needed.

We look forward to working with JLCAR, DES, and other stakeholders in further understanding the implications of the proposed MCL rules and how they should be adjusted and/or how they may be implemented thoughtfully, with as little disruption as possible and with reasonable costs shared equitably. NEBRA will be providing further detailed comments to JLCAR at the meeting when this topic is taken up for consideration. Those comments will further explain, with additional examples, why a JLCAR objection is necessary in accordance with JLCAR's rules. And if DES produces additional documents and arguments between now and the JLCAR meeting, we will consider those to be added evidence for the need for further formal public review and stakeholder discussion before the rules are finalized.

Thanking you for your consideration of these comments, I am,

Sincerely yours,

Ned Beecher
Special Projects Manager

cc. JLCAR members
Governor Chris Sununu
Commissioner Robert Scott, DES
Executive Councilor Michael Cryans
Senator Jeb Bradley
Representative Ed Butler
Representative Susan Ticehurst
Representative Jerry Knirk

EXHIBIT B

PFAS Regulatory & Guidance Limits for Drinking Water & Other Media

PFAS Regulatory & Guidance Limits for Drinking Water & Other Media – March 2020 (v.5.1)

nebra
North East Biosolids & Residuals Association

Jurisdiction	Standard[1]	PFOA (ppt)	PFOS (ppt)	5 PFAS[2] (ppt)	Notes
Drinking Water Limits					**ppt (ng/L) is customary measure for PFAS in water**
U.S. EPA (2016)	Advisory	70			Public Health Advisory (PHA) level
U.S. CDC – ATSDR (Oct. 2018)	Advisory	78/21	52/14		For Adult / For Child. Also PFHxS: 517/140, PFNA: 78/21
CA Prop 65 Listing (2017) CA OEHHA notification levels CA OEHHA response levels	Regulatory Developing Developing	Detection 5.1 10	Detection 6.5 40		Reproductive toxicity concern; requires labeling Adopted August 2019; level at which public water supply must notify local government. Planned for Oct. 2019 but delayed: response level at which water source is taken offline https://oehha.ca.gov/water/notification-levels-chemicals-drinking-water
CT – DEEP (2018)	Guidance			70	
MA – DEP (2018) MA - DEP (likely in 2020)	Guidance Regulatory			70 20	Proposed MCLs likely in 2020: 20 ppt for 6 PFAS, including PFDA.
MI – DEQ (2018) MI – DHHS/EGLE (Oct. 2019)	Guidance Developing	70 8	70 16		Promulgated rule. MI DEQ is also focused on source control / IPP. Also PFNA = 6 ppt, PFHxA = 400,000 ppt, PFHxS = 51 ppt, PFBS = 420 ppt, GenX = 370 ppt.
MN – Health Dept. (2019)	Regulatory	35	15		Health Risk Levels (HRLs). PFHxS: 47 ppt
NH – DES (effective Sep. 30, 2019)	Regulatory	12	15		PFNA: 11 ppt. PFHxS: 18 ppt. All are also groundwater standards. Court order halted NH DES enforcement of these MCLs as of Jan. 1, 2020, pending court review.
NJ – DEP (2018)	Developing	14	13		NJ DEP is proposing to make these guidance values MCLs, but action has been pending 2+ years. 2018 regulatory MCL limit for PFNA: 13 ppt.
NY – Health Dep. (2018)	Developing	10	10		Drinking Water Quality Council proposed MCLs; formal MCL rulemaking began July 2019.
PA – DEP (2018)	Developing	TBD	TBD		PFAS Action Team started work November 2018.
VT (2016)	Guidance			20	Will become MCL in 2020, per state law. See groundwater standard below.
WA – DEH (2017)	Developing	TBD	TBD		Departments of Ecology and Health; Chemical Action Plan being developed
Almost all other states	Advisory	70			Most states are using EPA PHA as guidance.
Australia Health (2017)		560	70		
Canada Health (Dec. 2018)	Regulatory	200	600	Sum of the ratios of the measured levels to the limits for PFOA + PFOS shall not exceed 1; e.g. 400 ppt is combined limit. Canada also set 20 ppt limit on PFNA & 200 – 600 ppt for other PFAS. BC PFOS limit = 300 ppt.	
Denmark (2015)	Regulatory	100	100		
Sweden (2018)	Advisory			90 (see note)	Take action if sum of 11 PFAS >90 ppt (PFBS, PFHxS, PFOS, 6:2 FTSA, PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFNA and PFDA)
European Union (2018)	Developing	100	100	500 (see note)	Proposed advisory; sum of all PFAS limit: 500 ppt
United Kingdom (2009)	Guidance	300	300		Admin. Level 1 (lowest drinking water screening values)

Surface Water Limits	Standard[1]	PFOA (ppt)	PFOS (ppt)	5 PFAS[2] (ppt)	Notes
MI (2015)	Regulatory	420	11		Applied to evaluation of wastewater effluent discharges.
Other states	no standards or screening values yet (except for OR 2011 "initiation levels": PFOA = 24,000 ppt, PFOS = 300,000 ppt, PFNA = 1,000 ppt, etc. Norway has an environmental quality standard for surface water of 9,100 ppt for PFOA and 0.65 ppt for PFOS. No other surface water standards known from other countries)				
Groundwater Limits					
U. S. EPA	Draft interim	70 (40 for each alone)			Proposed interim groundwater screening values
U. S. Dept. of Defense (DoD)	Guidance	400	400		PFBS = 40,000 ppt. These must be met for ending work on site cleanups. If more than 1 kind of PFAS is present, limits are 40 ppt each PFOA & PFOS, 40 ppb PFBS.
CO – DPHE	Regulatory	70	70		This is a groundwater cleanup goal for use in El Paso County only (ITRC T4 info).
MA – DEP	Regulatory			20	Groundwater level for contaminated site cleanup. Includes 6th PFAS: PFDA.
MI – DEQ	Regulatory	70			For groundwater used for drinking water
NH – DES (effective Oct. 1, 2019)	Regulatory	12	15		PFNA: 11 ppt. PFHxS: 18 ppt. All are also drinking water standards.
NJ – DEP (interim Mar. 2019)	Regulatory	10	10		PFNA groundwater quality standard (Sept. 2017): 13 ppt
VT – DEC (2018)	Regulatory			20	This is also used as drinking water guidance & will become an MCL in 2020.
Most other states	no standards				
Soil & Materials Screening		**PFOA (ppb)**	**PFOS (ppb)**		ppb (*u*g/kg) is customary measure for PFAS in soils, sludges, biosolids, etc.
U. S. EPA (2018)	Guidance	0.172	0.378		Regional Screening Levels (RSLs) modeled to protect groundwater; NEBRA does not believe these are defensible for use in biosolids land application scenarios.
AK – DEC (2018)	Proposed/on hold	0.29	0.53		Proposed – but on hold - Soil Cleanup, migration to groundwater risk
ME – DEP (Oct. 2018)	Regulatory	9.5	21		Remedial Action Guidelines (RAGs) for soil cleanup based on migration to groundwater risk modeling
ME – DEP (2017)	Regulatory	2.5	5.2		For screening solid waste for beneficial use; applied to biosolids by Maine DEP when moratorium on biosolids use imposed in March 2019. ME is the only state to screen biosolids for PFAS. NEBRA does not believe these are appropriate for use with biosolids.
MI – DEQ (2016)	Criteria	350	0.22		Groundwater Surface Water Protection Criteria
TX – CEQ (2017)	Protective Level	1.5 / 3.0	25 / 50		
VT – DEC (2016)	Regulatory	300			Soil screening level based on dermal contact & ingestion (not migration to groundwater pathway)
Most other states	no standards				

1 The standards & guidance limits here are the most stringent (lowest values) of which we are aware; some additional jurisdictions have established more lenient (higher value) limits.

2 sum of 5 of the 6 UCMR 2013 PFAS chemicals: PFNA, PFOA, PFOS, PFHpA, PFHxS (the 6th UCMR PFAS chemical is PFBS)

Compiled by NEBRA January 8, 2019. Updates June 23, July 25, Sept. 8, & Oct. 23, 2019; March 9, 2020. Corrections: ned.beecher@nebiosolids.org.

nebra
North East Biosolids & Residuals Association

EXHIBIT C

ASSENTS BY PLAINTIFFS AND DEFENDANT

REGARDING NEBRA FILING THIS *AMICUS* BRIEF

The following written statements providing assent were provided by independent, separate email correspondence on April 21, 2020:

Good afternoon Ned,

The State consents to NEBRA filing an amicus brief in this case.

Sincerely,
Chris

_____

Christopher G. Aslin
Senior Assistant Attorney General
Environmental Protection Bureau
33 Capitol Street Concord, NH 03301 Phone (603) 271-3679
Fax (603) 271-2110
christopher.aslin@doj.nh.gov

From: Ned Beecher <ned.beecher@nebiosolids.org>
Sent: Tuesday, April 21, 2020 11:39 AM
To: Brooks, Allen <K.Allen.Brooks@doj.nh.gov>; Aslin, Christopher <Christopher.Aslin@doj.nh.gov>
Subject: seeking assent as amicus, NH Supreme Court Case No. 2020-0058

EXTERNAL: Do not open attachments or click on links unless you recognize and trust sender.

Greetings,

I am writing to seek your assent for the North East Biosolids and Residuals Association (NEBRA) to file as *amicus* in NH Supreme Court Case No. 2020-0058 (Plymouth Village Water & Sewer Dist. et al v. Robert Scott, NHDES). Do you provide assent?

I am also seeking assent from attorneys for the plaintiffs.

Thank you. And all best wishes for health during these challenging times.

Ned

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Ned Beecher, Special Projects Manager

Use best sanitary practices at work.
Keep social distance.
Info for water quality professionals on Coronavirus SARS-CoV-2, which causes COVID-19:
https://www.wef.org/news-hub/current-priorities/coronavirus/

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PO Box 422
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603-323-7654
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3M assents as well.

MCLANE MIDDLETON
PROFESSIONAL ASSOCIATION
Manchester, NH | Woburn, MA | Concord, NH | Portsmouth, NH | Boston MA

Mark C. Rouvalis Director

Direct: (603) 628-1329
Fax: (603) 625-5650

900 E
NH 03

website | bio

Hi Ned,
RMI, Plymouth Village Water and Sewer District, and Hanson assent.
Thanks so much and stay well.
Beth

From: Ned Beecher <ned.beecher@nebiosolids.org>
Sent: Tuesday, April 21, 2020 10:32 AM
To: Terri L. Pastori <tpastori@pastorikrans.com>; Beth Deragon <bderagon@pastorikrans.com>; Mark Rouvalis <mark.rouvalis@mclane.com>; Joseph Foster <joseph.foster@mclane.com>; Mike Quinn <mike.quinn@mclane.com>; Nessa Horewitch Coppinger <NCoppinger@bdlaw.com>
Subject: seeking assent as amicus, NH Supreme Court Case No. 2020-0058

Greetings,

I am writing to seek your assent for NEBRA to file as *amicus* in NH Supreme Court Case No. 2020-0058 (Plymouth Village Water & Sewer Dist. et al v. DES). Do you provide assent?

I am also seeking assent from attorneys for the defendant.

Thank you. And all best wishes for health during these challenging times.

Ned

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Ned Beecher, Special Projects Manager

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Recycled organics: Tools for sustainability.