June 11, 2021

Re: Comments regarding an economic impact analysis for amendments to chapter NR 140 to set numerical standards to minimize the concentration of polluting substances in groundwater; DG-15-19

To the Wisconsin Department of Natural Resources:

On behalf of the Associated Recyclers of Wisconsin (AROW), the Wisconsin Badger Chapter of the Solid Waste Association of North America (SWANA), and the Wisconsin Counties Solid Waste Management Association (WCSWMA), the Wisconsin Solid Waste PFAS Coalition is providing comment on DG-15-19: Amendments to chapter NR 140 to set numerical standards to minimize the concentration of polluting substances in groundwater.

Introduction

The standards proposed in DG-15-19 for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) are at particularly low levels and could result in significant economic impacts to the solid waste industry. In the case of our municipally owned sites, this cost will ultimately be paid by our communities and the taxpayers of Wisconsin. We estimated costs to understand the approximate scale of economic impact for initial sampling for PFAS at a subset of state landfills, and for remedial site investigation and treatment at a hypothetical landfill where PFAS concentrations exceed proposed groundwater standards.

It is important to note that although solid waste facilities are recipients of PFAS contaminated waste such as food packaging, containers, and household cookware, they are **not** producers of PFAS. PFAS are released from decomposing municipal solid waste over time and have the potential to leave landfills in the form of leachate, or the liquid that is collected at the bottom of a landfill. Ultimately, the responsibility of leachate treatment and groundwater monitoring falls on the solid waste facility.

Sampling Costs for Initial Investigation

There are over 400 landfills (active and closed) in the state of Wisconsin that are required to monitor groundwater quality on a regular schedule. Establishing numerical standards for PFAS concentrations may result in the requirement that solid waste facilities also sample groundwater wells for PFAS.

To understand the cost implications of this additional monitoring requirement, we performed a back-of-the-envelope calculation assuming the following inputs:

- $375: Average costs for sampling for PFAS as cited in the FE&EIA. However, this number may be low; a recent quote requested from a

WISCONSIN SOLID WASTE PFAS COALITION

recyclemorewisconsin.org

swana-wi.org

wcswma.org/

About us

The Wisconsin Solid Waste PFAS Coalition was formed in 2019 to educate and inform our industry members, lawmakers, and the public about the relationship between PFAS and our waste.

The solid waste industry supports regulating these chemicals and has always held protection of human health and the environment as a core value; however, the health risks of PFAS need to be fully evaluated and weighed against other environmental pollutants before stringent standards are implemented.

Contact us

Meleesa Johnson, AROW President
715.573.3165
Meleesa.Johnson@co.marathon.wi.us

John Welch, SWANA President
608.516.4154
Welch@countyofdane.com

Gerry Neuser, WCSWMA President
920.683.4307
GerryNeuser@co.manitowoc.wi.us

Roxanne Wienkes, Coalition Coordinator
608.509.6681
Wienkes.Roxanne@countyofdane.com

certified lab to measure 33 PFAS compounds per the Wisconsin guidance method was $450 per sample.

- 15 to 30 groundwater monitoring wells: average number of wells at a landfill, though some sites have more and others fewer. We assume 50% of the wells would be sampled at each site in an initial sampling effort.
- $2,000 and $10,000: Cost for sample coordination, field mobilization, sample collection, and data analysis for a single sampling event.
- A field blank with every sample: due to the high likelihood for cross contamination from sampling equipment, PFAS sampling guidance recommends collection of quality control samples to ensure validity of results.

Using these assumptions, a conservative estimate of the cost for an individual landfill site to sample for PFAS during an initial event is between $7,600 and $21,000. Should the scale of the initial sampling investigation be similar to that performed in Minnesota (where PFAS sampling was required at approximately 100 landfill sites according to the FE&EIA), costs in Wisconsin are estimated between $760,000 and $2.1 million (sampling at 100 of 400 existing sites).

According to the FE&EIA, approximately 60% of the landfill sites in Minnesota exceeded the regulatory guidance for PFAS. Considering the pervasive and ubiquitous nature of PFAS, this is not surprising. If the State of Wisconsin sets enforcement standards and preventative action limits at levels so close to what we observe as background concentrations, we can only expect to see similar if not higher rates of exceedances, which would result in additional ongoing monitoring and remedial site investigations. Should a significant portion of the sampled wells require additional PFAS monitoring (i.e 60% of the 100 landfills initially tested), ongoing sampling costs by our estimate quickly balloon to over $1 million annually.

Estimated Costs if PFAS are detected at a Landfill

The purpose of the following section is to further evaluate costs that one municipal landfill might incur should PFAS exceed proposed groundwater standards. Typical additional work at a site where PFAS are detected in groundwater would encompass two phases: first, a remedial site investigation, and second, remedial action.

Remedial Site Investigation

Costs associated with more substantial remedial site investigation at an individual site will vary but could exceed $1 million depending on the number and depth of wells needed for any further investigation. Table 1 presents a range of costs for a single site investigation.

Table 1: Estimated costs for a remedial site investigation based on costs observed at other Wisconsin sites (NR700 cases).

Task	*Estimated Cost*		
Preparation, Scoping, and Workplan	$70,000	-	$200,000
Well Network Installation	$50,000	-	$400,000
Sampling and Analysis (8 round min.)	$80,000	-	$175,000
Remedial Design	$100,000	-	$300,000
Total Estimate Annual Cost	**$300,000**	**-**	**$1,075,000**

Remedial Action

At landfills where remedial action is necessary, costs will vary based on the extent of the impacts, but estimates could quickly exceed $900,000 annually per site. Table 2 presents costs for an example groundwater PFAS sequestration for a system with capacity of 150 gallons per minute. For context, a household potable well pump has a capacity of 5-10 gallons per minute.

While the most appropriate technology for PFAS destruction is uncertain, there are technologies that can sequester (consolidate and remove) PFAS. All available technologies produce highly-concentrated, residual PFAS as a waste product. For illustrative purposes, we have chosen a media-based sequestration system with pre-treatment for solids removal.

Table 2: Example costs for a PFAS sequestration system.

Task	*Estimated Annual Cost*
Mobilization/Demobilization of Sequestration Equipment (tanks, media beds, pumps)	$140,000
Rental of Sequestration Equipment	$140,000
Consumables (flocculent, media)	$200,000
Media Disposal (assuming hazardous designation)	$150,000
System Operation and Discharge Treatment	$150,000
15% Contingency Costs	$120,000
Total Estimate Annual Cost	**$900,000**

At active landfills, these remediation costs will ultimately impact landfill disposal rates and landfill users. For instance, to finance an additional $1 million in remediation costs, a landfill that manages 250,000 tons of waste per year would need to increase disposal rates by $4/ton. For a municipality with 50,000 residents, that could mean an additional $27,000 in disposal costs (assuming 3 pounds of waste per person per day). Please note that this is just the cost for sequestering PFAS in groundwater and does not include the cost of sequestering PFAS in leachate.

In cases where a landfill is still under monitoring requirements but is no longer generating revenue, those costs will need to be realized by the legal authority associated with the site. In most cases, legal responsibility falls to local and county municipalities, which again will translate to increased tax burden for our communities.

None of the above information assumes that the landfill or solid waste facility released or is responsible for PFAS in groundwater. Background levels of PFAS may be present in groundwater at or above enforcement limits.

Summary

The solid waste and recycling industry works every day to protect human health and the environment by managing materials that industries and households discard. We do so according to prescribed legal requirements and social conscientiousness based on the information available to us when materials are received. We accepted waste materials in good faith and now, based on growing expectations of regulatory standards for mitigating the harm of PFAS, face significant financial and technical hurdles.

Our investigation into the cost and complexity of advanced PFAS sequestration methods may include the following costs to the solid waste industry alone:

- initial sampling at just a subset of the state's landfills : $ 1 million
- additional ongoing monitoring and remedial site investigations : $1 million annually
- Estimated costs for a remedial site investigation : $300,000 to $1,075,000 per site
- Example operational cost of PFAS removal from groundwater : $900,000 per site annually

Detection of elevated PFAS concentrations at just a handful of the state's hundreds of landfill sites could lead to millions of dollars in investigations and millions of dollars in annual remediation costs. These estimates indicate that addressing this problem in this way will be prohibitively expensive. It is imperative that the legislature, WDNR, local units of government, and the waste sector collaborate to ensure that solid waste facilities, and other passive receivers, not only identify PFAS sequestration options that do not place a disproportionate financial burden on any one sector, but also ban or further minimize the ongoing manufacturing of PFAS containing products to incrementally decrease future exposure and mitigation efforts.

Thank you for your consideration of the potential financial impacts of this legislation to the solid waste industry. The goal of any PFAS policy or regulation should be to determine the most effective steps needed to reduce human exposure and implement them within the broad context of protecting human health Legislators, regulators, and drinking water agencies, wastewater, and solid waste agencies must work collaboratively to examine how to manage PFAS holistically, with science driving the decision making.