Niagara Region

Waste Management Services
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MEMORANDUM

WMPSC-C 18-2023

Subject: Environment and Climate Change Canada's Proposed Methane Regulation

Date: June 26, 2023

To: Waste Management Planning Steering Committee

From: Emil Prpic, Associate Director, Waste Disposal Operations & Engineering

This memorandum is intended to provide the Waste Management Planning Steering Committee with an update on the methane regulation as proposed by Environment and Climate Change Canada (ECCC), as well as the Niagara Region's response to this proposed regulation.

Overview

Methane is a powerful greenhouse gas that is generated when biodegradable waste such as food and paper materials are disposed in landfills. In fact, methane is more than 25 times as potent as carbon dioxide at trapping heat in the atmosphere. This process occurs over many years, which means that the methane generated in landfills today is the result of decades of disposal of biodegradable waste. In 2020, emissions from Canadian landfills accounted for 24% of national methane emissions.

In October 2021, Canada announced support for the Global Methane Pledge which aims to reduce global methane emissions by 30% below 2020 levels by 2030. Through the Government of Canada's *Faster and Further: Canada's Methane Strategy, Canada reaffirmed its* commitment to taking comprehensive domestic actions to reduce methane, including in the waste sector. This commitment further builds on the Government of Canada's goal of achieving net-zero emissions by 2050. The methane strategy reiterates the intention to develop new federal regulations that will reduce landfill methane emissions.

In January 2022, ECCC published the discussion paper entitled "*Reducing methane emissions from Canada's municipal solid waste landfills*". The discussion paper proposed a number of objectives to be considered in the development of the new regulation. In September 2022, the ECCC issued a "What We Heard" report based on the feedback that they received from interested groups on the discussion paper. In April 2023, the ECCC requested feedback on a proposed regulatory framework which outlines the key requirements under consideration.

Proposed Regulations

In October 2022, ECCC formed a Technical Working Group (TWG) to support discussions on potential elements of federal regulations. ECCC sought specific feedback from TWG members to gather information and idea exchanges that assisted in shaping regulatory elements and options including identifying technical barriers and opportunities that should be reflected in the proposed regulatory framework.

Several key areas where the TWG provided feedback include the applicability of the regulation, landfill methane control technologies, monitoring and measuring methane, design standards, and the costs and benefits of the proposed regulations. The key elements of the framework include the following:

- Description of landfills that would be subject to the regulation and assessment requirements i.e., criteria and thresholds requiring methane control systems
- Requirements to control methane emissions
- Monitoring plan and corrective action
- Recordkeeping and reporting

The methane regulations would apply to landfills that accepted more than the specified quantity of municipal solid. Landfills that exceeded the prescribed tonnage threshold would be required to complete a methane generation assessment. If the assessment determines that the threshold is exceeded the landfill would be required to install a methane control system which may include a gas collection system to recover the methane, a flaring system to “destroy” the methane, introducing a biological process or potentially a combination of systems.

Niagara Region Participation

Niagara Region staff have been active participants in the development of the methane regulation framework. Staff provided responses to the initial January 2022 discussion paper, participated on the TWG and in May, provided feedback, attached as Appendix 1, to the ECCC on the regulatory framework. Additionally, staff have provided further comment through Ontario waste management industry organizations including Waste to Resource Ontario (formerly Ontario Waste Management Association) and the Ontario chapter of the Solid Waste Association of North America’s (SWANA).

Challenges of the Proposed Regulatory Framework

Over the past year ECCC has demonstrated a willingness to consider feedback from stakeholders during the consultation and has been flexible in terms of adjusting the proposed framework. That being said, staff have identified to ECCC that a number of issues still remain with the proposed regulation as outlined below.

Key Issues

- Short timelines to implement different regulatory requirements
- Anticipated lack of qualified experts to assess, design and implement methane control systems
- Increased costs to landfill owners – capital and operating
- Additional costs may lead to the export of waste to the United States
- Tonnage and methane generation criteria / thresholds are very restrictive
- Value for money – greater consideration should be given to reducing waste generation e.g., prioritizing and supporting organics diversion programs
- Further clarity is required for certain parts of the proposed regulations

Impacts to Niagara Region

Niagara Region could potentially be required to install methane reduction systems at both the Bridge Street Landfill and Niagara Road 12 Landfill. It is estimated that such systems would cost approximately $15 million ($10 million at Bridge Street and $5 million at Niagara Road 12) based on 2023 estimates. Nonetheless, the actual requirements and costs remain unknown until the methane regulations are finalized.

Next Steps

In 2024, ECCC anticipates issuing a draft of the methane regulations followed by a final regulation later in the year. It is anticipated that the regulatory requirements will become enforceable some time between 2027 – 2029 which would align with the Government of Canada's Global Methane Pledge to reduce methane generation beginning in 2030.

Staff will continue to participate in the development of the regulation and will keep the Committee updated on progress.

Respectfully submitted and signed by

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Emil Prpic
Associate Director, Waste Disposal Operations & Engineering
Waste Management Services

Appendix 1 Regional Municipality of Niagara comments on Reducing Canada's landfill methane emissions – Proposed Regulatory Framework

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May 19, 2023

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Submitted Via E-mail: ges-dechets-ghg-waste@ec.gc.ca

Dear Mr. Drouin

Re: Regional Municipality of Niagara comments on Reducing Canada's landfill methane emissions – Proposed Regulatory Framework

Niagara Region appreciates the opportunity to comment on the proposed regulatory framework "Reducing Canada's landfill methane emissions – proposed regulatory framework" (Framework) document. Niagara Region is supportive of Environment and Climate Change Canada's (ECCC) objective of reducing methane emissions from the environment and landfills where feasible and which will result in significant improvement to mitigate the generation and control of landfill methane emissions.
Niagara Region has reviewed the Framework and offers the following comments for consideration by ECCC.

APPLICATION AND ASSESSMENT REQUIREMENTS

Methane generation assessment and threshold

Requiring methane generation assessments to be completed within ninety (90) days after the regulation comes into effect or by June 1 the year after a landfill becomes subject to the regulation may be an insufficient amount of time to complete the assessment. Even though ECCC has created a relatively simple model, there are a limited number of consultants and subject matter experts which are capable of undertaking such assessments and many municipalities do not have the internal expertise to carry out such work. As a result, the experts relied upon to complete the assessments may be unavailable to complete the assessments during the required time period.

Measured methane emissions

Path-integrated / Surface methane concentrations

The Framework states that "in some cases, the landfill methane generation modeling may not accurately represent the scale of methane being generated and emitted at certain sites" and that a specific type of drone based detection technique "holds promise to detect the same methane emission hotspots that may be measured using ground-based methods."

In February 2019, SCS Engineers (SCS) prepared a document entitled "Methods for Estimating, Measuring, and Monitoring Landfill Methane Emissions" for ECCC. At that time, SCS stated the following with respect to Infrared (IR) cameras:

> "They are not in common use in the solid waste industry, and there are application specific challenges that may need to be overcome before widespread adoption, but the technology is demonstrated in principle by widespread use in the oil and gas industry."

SCS further states the following about optical technologies:

> "In addition to IR cameras, other optical technologies, such as hyperspectral imaging and thermal imaging, have application at landfills. Those applications are currently niche applications and are not used as methane monitoring, but they may have future application in monitoring programs."

SCS closed the document by stating (emphasis added):

> "SCS also believes that **IR imaging is a promising technology that complements SEM. It is not as robustly demonstrated for landfill application as SEM, but it should be considered as an alternative or complement to SEM**. IR imaging has the potential to quickly identify high methane emission points on landfills that could potentially be missed by SEM, while SEM has the ability to quantify the concentration of methane accurately at such hot spots. They could work well in concert, but the combined costs may make them prohibitive for many individual sites."

The regulation needs to be clear and remove any ambiguity with respect to the type(s) of modelling that will be accepted before landfill owners begin investing in such technology and initiating assessments. Based on discussions with other landfills owners who have tested drone monitoring, getting data to line up with the surface emissions monitoring has not been successful. It is great emerging technology but it must be properly vetted for accuracy and reliability if it is to be used in a regulatory environment.

It is noted that whether drone (IR) or surface measurements are deemed acceptable, flying them at 5m high with a spacing of less than 15m or at 5cm with spacing less than

7.5m respectively, the sampling grid is very tight. This will add significant effort and operating cost for landfill owners. Consideration should be given to increasing the spacing. As it stands, landfill owners will be required to work with consultants or hire additional staff, not to mention procure new equipment at significant added cost.

Low methane content in recovered landfill gas

If a landfill owner identifies an average annual methane concentration of less than 25% volume in a closed landfill, it is highly unlikely it will increase again. Landfill gas production curves from many different landfill sites, as well as, operational data have shown that to be the case. For that reason, it is recommended that ECCC give consideration to reducing the need to control methane emissions for a further 5 years down to 2-3 years.

REQUIREMENTS TO CONTROL METHANE EMISSIONS

Implementation of a landfill methane control approach

The implementation of landfill methane controls will generally involve budgeting, funding, design, and construction. Given that ECCC plans to publish the final regulations in 2024, landfill owners will likely have enough time to budget. That being said, providing one to two years to implement most control approaches following an exceedance (especially one that is unforeseen) is unreasonable, depending on the scope of the methane control system to be designed and constructed. As mentioned, there are a limited number of experts in this field that are capable of providing the services to design and construct the required systems/upgrades. Niagara Region recommends the timeline for implementation of control systems/upgrades be based on the type, complexity and cost of the system with more time afforded for complex systems.

The framework proposes 664 tonnes per year as the methane generation threshold and is exploring options to allow landfills that have an offset to do so for as long as possible.

Any landfill over 1,000 tonnes per year would be immediately subject to regulation. Landfills between 664 tonnes and 1,000 tonnes per year would be given additional time to generate offset credits. This would assist some of the landfill owners of smaller sites to realize some offsets and reduce their financial exposure.

Based on the Framework and the timelines within, it is estimated that landfill owners might be able to secure enough credits to cover initial design costs.

In addition, ECCC needs to give consideration to Canadian Standards Association (CSA) Code B149.6-2020 – Code for Digester Gas, Landfill Gas and Biogas Generation and Utilization. In provinces like Ontario where it is enforced (by Technical Standards and Safety Authority (TSSA)), it adds additional approval and operating requirements. For example, even though the Ministry of Environment, Conservation and Parks (MECP) would provide the Environmental Compliance Approval, the TSSA must provide field approvals for certain parts of the landfill gas system. Further, any staff that operate the

system must be properly trained. In Ontario, this is a full week off-site training course that contributes to additional time and expense to landfill owners.

Performance Standard – Surface methane emission limits

Greater clarity is required in describing an exceedance(s). For example, is one (1) exceedance in a twelve (12) month period sufficient to trigger the implementation of a methane control system, is it three (3) exceedances over a twenty-four (24) month period, etc.

It is also not clear why the ECCC has selected averages over an area of 4,500 m^2 since this area is quite small. This will result in a large number of zones at landfill sites. At our Humberstone Landfill it would result in about 83 zones. It is not clear if an exceedance is identified in one zone will necessitate a site wide response to be in compliance. The Framework states (emphasis added):

"Landfills that exceed the methane generation threshold of 664 tonnes per year, and are not exempt based on surface methane monitoring results, **would be required to implement a landfill methane control approach that meets the performance standard** described below"

ECCC should provide additional clarity. Is the landfill methane control limited to the zone with the exceedance or site wide? It is recommended that the control approach be limited to the zone with the exceedance.

REQUIREMENT FOR METHANE MONITORING AND CORRECTIVE ACTION PLAN

The Regulation will result in substantial financial impacts to landfill owners especially if they exceed regulatory thresholds. Costs will include the initial assessment of methane generation, capital costs for the implementation of methane control systems, and on-going monitoring. Depending on the number of landfills and type of control systems required this would increase the capital and operating costs to landfill owners.

In our previous comments (April 12, 2022) on the ECCCs Reducing methane emissions from Canada's municipal solid waste landfills paper, Niagara Region highlighted that the ECCC mitigate or assist in covering the capital and / or operating costs. Cost mitigation options may include ECCC paying for assessments, setting up funding programs, establishing methane credits similar to carbon credits, and so on. Being entirely reliant on landfill owners to implement the Regulation will be financially challenging especially for owners of smaller or closed landfills which have limited or no funding to undertake the required work.

Monitoring landfill gas recovery systems

The framework document states that "Landfills would be required to develop site-specific action thresholds". Does this mean that landfill operators will determine their own thresholds? ECCC needs to provide clarity on this requirement.

Monitoring engineered biocover/biosystems

At the moment there is little information available within the industry to verify/validate the potential success of biocover/biosystems on a larger scale. More work is required to assess if this technology will work effectively to reduce landfill methane generation. As for monitoring, more information is required. One of the tests noted is:

- annual in situ testing to monitor temporal changes to microbial methane oxidation capacity relative to initial oxidation capacity at the time of installation

More details are required in regards to this testing. Who can do it, what are the thresholds, etc.?

Monitoring to identify methane leaks

It is not clear why additional inspections to identify methane leaks are required on a monthly basis when drone/surface based monitoring is completed three (3) times per year. The requirements identified in this section are typically part of an Operations, Design and Operations Manual or other similar document.

If monitoring reductions will be permitted based on specified performance standards not being exceeded during any of the three (3) monitoring events, it should take three (3) exceedances for the frequency to revert to triannual.

The last paragraph of this section states:

> The regulations may require these same corrective actions to be taken if the landfill owner receives a notification from ECCC indicating a third-party measurement (from a methane emissions monitoring system or survey) of methane emissions exceeding a specified threshold (e.g. 100 kg/hr) has been published or reported to ECCC.

Niagara Region has concerns with this statement. As worded, this statement would allow anyone to provide information to ECCC that would be used to enforce corrective actions. This statement needs to be clarified. Only data from a qualified person (who should be defined in Regulation) with properly calibrated equipment would be acceptable, provided that the landfill owner is aware of the measurements being taken and has permitted the qualified person(s) to access the site and collect data regardless of methodology.

Notifications, record keeping and annual reporting

As it pertains to annual reporting, most landfill owners in Ontario already submit Annual Monitoring, Operations and Performance Reports to the MECP in accordance with our provincial approvals. In fact, some of the information that is being requested (i.e., waste received, in place etc.) is already part of an open sites Operations Report. It is recommended that the annual reporting requirements be combined with existing provincial reporting requirements to avoid duplication.

Closing

Niagara Region is encouraged by the fact that ECCC has given consideration and implemented a number of the recommendations that have been submitted by stakeholders over the past year. Nevertheless, there are a number of remaining issues as outlined in Niagara Region's comments including the anticipated lack of expertise, short timelines to implement the various regulatory requirements, additional costs to landfill owners and options to offset or fund increased costs, and there are certain parts of the framework which require further clarification.

As expressed to ECCC during consultation with the Technical Work Group, we do have concerns that for a number of Canadian provinces like British Columbia, Ontario, Quebec higher landfill costs could lead to the export of waste to the US due to lower tipping fees. This already happens in Ontario with roughly a third of all of Ontario's waste being disposed in Michigan and New York. The Region still feels that driving resources away from disposal and reducing waste generation should also be considered. It is very important for the federal government to consider the best value for money to reduce landfill emissions. In some cases, value for money may be best driven through organic diversion programs rather than methane gas reduction requirements for smaller landfills.

Thank you for the opportunity to comment on the proposed regulatory framework "Reducing Canada's landfill ethane emissions". Niagara Region looks forward to any additional consultation regarding landfill methane reductions.

If you have further questions or require clarification on the above, please contact Emil Prpic, Associate Director, Waste Disposal Operations and Engineering at emil.prpic@niagararegion.ca or at 905.980.6000, extension 3303.

Sincerely,

Catherine Habermebl
Director, Waste Management Services

cc. Emil Prpic, Associate Director, Waste Disposal Operations and Engineering
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