APPENDIX A

BIOSOLIDS LITERATURE REVIEW

TERMS OF REFERENCE

April 2024

BACKGROUND

In 2011, the Capital Regional District (CRD) Board passed a resolution to ban the land application of biosolids from CRD facilities primarily due to concerns about the potential human and environmental risks of contaminants therein. This ban ended a small CRD program that distributed lime-stabilized Class A biosolids (as defined under the BC Organic Matter Recycling Regulations [OMRR]) from a sub-regional wastewater treatment plant to the general public and local landscaping businesses. In 2020, the CRD commissioned a new wastewater treatment plant that substantially increased the volume of Class A biosolids produced annually to approximately 3,600 tonnes. Biosolids management options were subsequently introduced.

As per BC Ministry of Environment and Climate Change Strategy (ENV) expectations, Canadian Council of Ministers of the Environment guidance, and CRD commitments under its Core Area Liquid Waste Management Plan, the CRD is required to beneficially use all biosolids output. In BC, biosolids land application is regulated under OMRR. A long-term biosolids management plan is currently under development and is due to ENV by June 2024.

Currently, CRD Class A biosolids are being managed under a short-term biosolids management plan (2020-2025), with the primary beneficial use options being incineration as an alternative fuel in a cement manufacturing plant in Richmond, BC, and integration with landfill cover systems as contingencies. When neither of these options are available, landfilling biosolids at the regional landfill has been the only alternative. However, in 2023, given significant operational and logistical challenges with the short-term options, the CRD Board amended its position to allow for limited non-agricultural land application of biosolids as a contingency option. The CRD has secured the use of biosolids for industrial land reclamation at a quarry near Cassidy, BC. CRD staff continue to seek additional short-term beneficial use contingency options that meet Board limits, in order to limit or avoid landfilling of biosolids when the other options are not available.

As part of development of the CRD's long-term biosolids management plan, the CRD has external technical advice that recommends that land application be included in a portfolio of options to ensure program redundancy and resiliency. Land application is typically the most reliable and cost-effective beneficial use option. However, there continue to be concerns raised about the potential human health and environmental risks associated with biosolids land application.

In response to these concerns, raised both in the CRD and elsewhere in the province and around the world, ENV convened a technical working group to review the OMRR to ensure it remains protective of human health and the environment. A summary report is expected in Q2 2024. In the meantime, the CRD Board is seeking its own independent literature review on the risks and benefits of biosolids land application.

PURPOSE

The purpose of the literature review is to provide the Board and general public a summary of the human health and environmental risks, and benefits of the land application of CRD Class A biosolids.

AUTHOR(S) QUALIFICATIONS

The author(s) undertaking the literature review must include at least one tenured faculty member from an independent academic institution(s) with expertise and experience in assessing human health and environmental risk, knowledge of biosolids land application practices, and an understanding of contaminant fate and impact. Additional co-authors with relevant expertise can be included if a team approach is taken.

SCOPE

The literature review must:

- Build on previous literature reviews through a comprehensive scan of up-to-date primary scientific literature and other relevant studies.
- Consider environmental conditions typical of BC's south coastal region.
- Assess the human health and environmental risks of legacy contaminants, and those of emerging concern, that are potentially found in biosolids.
- Summarize contaminant concentrations in biosolids relative to levels of exposure in general society.
- Discuss the limitations of extrapolating lab-based toxicity testing to observations in the environment.
- Summarize areas of uncertainty in biosolids land application risk, including a summary of relevant techniques for evaluating and addressing uncertainty.
- Summarize biosolids land application techniques that can reduce risk and/or address uncertainty.
- Briefly summarize risks and concerns that have resulted in land application bans elsewhere.
- Briefly summarize risks and benefits of longstanding land application programs elsewhere.
- Assess the overall risks of biosolids land application considering the intent of the Precautionary Principle (Rio Declaration, 1992 and subsequent derivations).

The CRD will provide the author(s) with a summary of the known contaminant concentrations in CRD Class A biosolids and a list of the potential land application opportunities that have been identified as the long-term biosolids management plan is being developed.

The literature review author(s) are not expected to undertake new scientific experiments as part of this project.

DELIVERABLES

The literature review must provide a comprehensive and up-to-date summary of the human health and environmental risks, and benefits, of biosolids land application. It must include an executive summary and/or conclusions section that is understandable by a non-technical general public.

TIMELINE

The literature review must be completed within three months of project commencement.

BUDGET

The literature review will have a maximum budget of $40,000.