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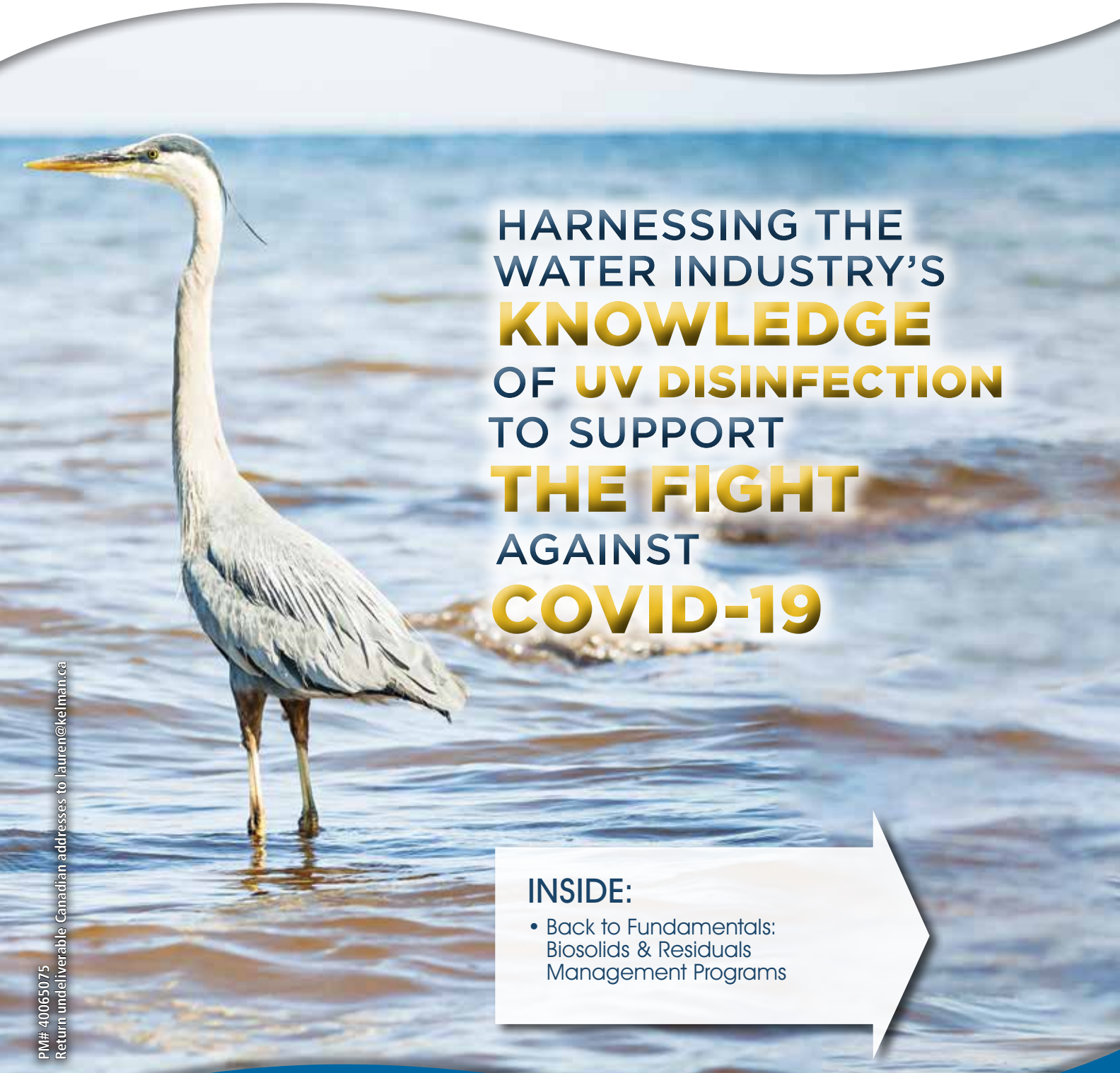

HARNESSING THE WATER INDUSTRY'S KNOWLEDGE OF UV DISINFECTION TO SUPPORT THE FIGHT AGAINST COVID-19

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- Back to Fundamentals: Biosolids & Residuals Management Programs

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ATLANTIC CANADA WATER & WASTEWATER ASSOCIATION

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Biosolid/residual management programs – They should be the first to plan, not the last!

By Lise LeBlanc, LP Consulting Ltd., Lower Sackville, NS

For the past 20+ years, we continue to see residual management as a low priority in the planning process. At wastewater conferences, speakers talk about building plants and programs but do not usually discuss what happens with the end-product. Occasionally they indicate that it will be stored in lagoons or sent to farmers. Working on residual management after it becomes a problem leads to very expensive short-term solutions.

There are risks that need to be managed with both beneficial reuse technologies (land application, energy recovery, etc.) and non-reuse options (landfill capping). Regulations on managing biosolids/residuals continue to evolve and change as laboratory techniques advance. What are the options if biosolids/residuals cannot be used as cover if organics are banned from landfills? What if the lagoon is overflowing but can't be land applied as it does not meet provincial Class A standards? What if the company that removes solids from the lagoon finds out they don't have a place to put it because regulations are getting stricter due to emerging substances of concern such as per- and polyfluoroalkyl substances (PFAS)?

Municipalities are recognizing the importance of evaluating beneficial reuse opportunities. Many are told "build it and they will come" but that strategy has never been successful. Evaluating why the program isn't working after the fact often leads to high costs.

Based on successful beneficial reuse programs in agriculture, the opportunities and challenges that should be considered when planning for success are summarized below.

When evaluating opportunities such as land application for municipal biosolids/residuals, consider the following:

- Build a program that includes unforeseen costs. Biosolids/residuals continue to be made every day, regardless of demand/weather/timing of application. That is inherently risky.
- Returns are typically low on beneficial reuse biosolids/residuals unless the value has been increased through blending with other materials. Even then, the cost vs. return must be calculated.
- Recognize that partners/distributors are not going to take on the risk of a program until a large enough profit return can be realized. Beneficial reuse programs take time to establish and require continuous effort to be and remain successful.
- Ensure there is a market for what the residual will provide and it's within 100 km of the plant.
- Work with an agricultural specialist/team that knows the market and has built a reputation on trust and partnership. Relationships count in agriculture.

Challenges of beneficial reuse programs

1. **Lack of storage**. Storage can be expensive therefore Industry tends to build one- to four-month storages. Agriculture applies residuals in spring and fall so storage is required for the off months. Climate change has had a significant impact on agricultural production, shortening windows of spreading/planting/harvesting opportunities. Provincial guidelines suggest farms build seven-month manure storages, but often even nine-month storages are not large enough if spring and fall are too wet. Weather always impacts sales potential of residuals.

2. **Lack of understanding of the market.** Not all farms have the same demand. Local agricultural statistics do not provide adequate information to determine if there is a market. Biosolids/residual demand is limited to certain crops, either because of economics of utilizing the residual or negative perceptions. Biosolids or any product made with biosolids cannot be used on land that grows fruits and vegetables, further restricting opportunities.

3. **Trucking and costs.** For the agricultural community to purchase and use biosolids/residuals, they must provide a significant return on their dollar. Trucking costs have an impact on program success. Beneficial reuse programs can cost more than traditional fertilizers, typically in time and trucking fees.
   - Need to apply much higher application rates than fertilizers (faster to apply 100 lbs/acre vs. 3–10 tonnes/acre).
   - Residuals can require more expensive specialized equipment to spread – i.e., more than $50,000 investment by the farmer.
   - If the Municipality cannot prove that the product saves money on fertilizers and/or lime while providing an increase in yield, farmers will not participate in the program.

4. **Odour.** Agriculture does not want to use residuals that have a lot of odour as it creates difficulties with neighbours and the communities they work and live in.

Opportunities of beneficial reuse programs

- A successful biosolid/ residual program can provide municipalities savings and revenue
- Improved public image by working with agriculture to increase soil health and combat climate change
- Future opportunity for carbon credits
- Participate in the green economy by providing local sustainable nutrients and organic matter that offsets fossil fuel products

Lise LeBlanc giving a tour of N-rich biosolids program in HRM

Industry has been frustrated when they produce a beneficial residual but find that selling to farmers is not about waiting for the orders to come in. Industry needs to liaise with the agricultural community which includes agricultural service providers and government. They need to provide research information to prove their residual works, set out demonstration fields, give presentations at farm meetings, etc. Farmers want technical advice on how to use the residual based on their soil analysis. They need the residual at specific times and typically in large tonnages in a short period of time. Working with an agricultural specialist is key to providing this information as they have the knowledge and the relationships with the farm clients.

If municipal biosolids/residuals programs are developed with these challenges in mind, the benefits to their bottom line, their constituents (which includes agriculture), and ultimately to the environment is a win-win for everyone.

The "Back to Fundamentals" department is published in each edition of *Go With the Flow* magazine. It is intended to cover a broad range of fundamental water and wastewater topics that will be driven by you, the readers of this magazine. If you find a topic particularly interesting or confusing, most likely others do as well. Please forward your ideas for future columns to Kyle MacIntyre, Dillon Consulting (*kmacintyre@dillon.ca*) or John Lam (*john.lam@novascotia.ca*) and we will respond in future publications to your queries.