
Biorem ramps R&D in air emissions control

By *Emma Ritch*

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Ontario-based Biorem (TSXV:[BRM](#) [1]) said today it secured a C\$720,000 (US\$673,000) contract for the newest version of its advanced biofiltration technology.

The two-stage air emissions control system is expected to remove potentially deadly chemical compounds that also cause odors at a municipal wastewater treatment facility in southern British Columbia. It's one of more than 30 equipment contracts the company has signed this year in North America, plus about five in China.

But the company is also pursuing an application for its bacteria-based filtration technology that could be even more lucrative: absorbing harmful emissions from industrial processes, CEO Peter Bruijns told the Cleantech Group today.

"The air emissions regulations are only going to get stronger, especially as they pertain to greenhouse gas emissions worldwide," Bruijns said. "We're redirecting the company from purely odor control to also addressing air emissions."

Bruijns said Biorem is in the final stages of developing a new proprietary system to clean air emissions using the same biological process. Depending on the speed of research and development, Biorem could have the process ready in about six to eight months, Bruijns said.

"It would displace thermal oxidizers that burn oxygen to destroy volatile organic compounds," he said.

Biorem's biofiltration technology flows polluted air into a biofilter that's kept moist with an irrigation system to create humidity. The pollutants become solubilized in the water, at which point the bacteria digest the contaminants, allowing clean air to exit.

The process uses common bacteria found in dirt, and the bacteria population self-adjusts according to the availability of the food source. Biorem manages the irrigation, temperature and pH levels inside the system to create ideal conditions for the particular type of bacteria needed to dispose of the different pollutants, Bruijns said. For example, low pH levels would allow the bacteria to more aggressively treat hydrogen sulfide but inhibit the ability to treat other compounds. That's why Biorem designs the system based on the pollutant output, which Bruijns said it typically fairly constant.

"It's complicated to manage the process, but the way it works is very straightforward," he said.

The key to Biorem's intellectual property is the media used in the biofiltration system. Bruijns declined to give details but said the challenge was to shrink the footprint of the system while increasing treatment capacity.

"We're developing a media material that has the maximum amount of surface area," he said. "The more surface area, the more bacteria grows, and the more air you can treat."

Researchers from the University of Maryland's Maryland NanoCenter revealed similar work earlier this year that created nanopores to vastly increase the surface area of electrostatic capacitors in order to increase energy density (see [Next-gen car solution? Scientists expand uses for electrostatic capacitor](#) [2]).

Biorem said the new municipal odor-control project is expected to use a biotrickling filter followed by a biofilter to treat 9,000 cubic meters of contaminated air per hour. The system is expected to begin removing hydrogen sulfide and dimethyl disulfide by the second quarter of 2010.

Hydrogen sulfide can cause odor problems at one or two parts-per-million (ppm), and be fatal to humans at 20 ppm. Bruijns said Biorem's system can treat 300 ppm and is expected to remove more than 95 percent of the chemical compounds and odor.

"The alternative to our technology is activated carbon or chemical scrubbers that use harmful chemicals," Bruijns said.

The odor-treatment system uses the company's new XLD media, which has been used in three other odor control projects since it was launched last year. Bruijns said the new media allows the company to make the systems half the size as it did previously, reducing the capital cost. Bruijns said the system has a very low operational cost compared to competitors, mostly in the form of electricity to run fans.

Biorem now hopes to mimic those modifications in the systems to treat air emissions. Bruijns said the company plans to improve the system performance and halve the size in order to reduce capital costs. The company already has systems installed in the automotive assembly, parts suppliers, food and beverage, and composting sectors.

In addition, Biorem is testing a new version of its emissions technology at a New Jersey Superfund site, which is being monitored by the U.S. Environmental Protection Agency.

"We need to get regulators to buy into this new technological solution," he said. "Regulators want to see data and a track record."

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