Voyageur Pharmaceuticals Completes Mueller Iodine Pilot Plant and Invites Oil and Gas Producers and Water Owners to Join Its Field Program

written by Raj Shah | November 24, 2026

Pilot mobilizing to the field, with first field trial expected to commence the first week of December 2026; Houston iodine-speciation laboratory now screening operator brine samples

November 24, 2026 (Source) — Voyageur Pharmaceuticals Ltd. (TSXV: VM) (OTC Pink: VYYRF) ("Voyageur" or the "Company"), a Canadian developer of pharmaceutical-grade barium and iodine contrast media for medical imaging, announces that its transportable Mueller process field pilot plant is complete and ready to deploy, and that its Houston laboratory is routinely measuring iodide and other iodine species in oilfield produced water. The Company is mobilizing equipment and deploying the pilot to the field, with its first field trial expected to commence in the first week of December 2026. The trial will begin at one location and then move from site to site, testing produced water from multiple wells and brines across a range of iodine concentrations. Voyageur has NDAs in place, is in negotiations or is collaborating with several companies, and invites additional oil and gas producers, saltwater disposal (SWD) companies and midstream water companies to submit produced-water samples for iodine screening and to discuss hosting the pilot's subsequent field deployments.

Built and Ready: The Mueller Field Pilot

The pilot plant is a self-contained, mobile unit designed to connect directly to an operator’s produced-water stream at a well site, SWD facility or water-handling hub. It is sized to process up to 15,000 litres of produced water per day and runs the Company’s closed-loop Mueller iodine extraction process on unaltered field brine. The Mueller process is covered by full utility patent applications, with the initial patent expected to issue in 2027.

Key design features of the pilot include:

- **No blow-out stripping towers.** The Mueller process uses four main steps versus seven for the legacy blow-out process, with no volatile organic compound (VOC) or air emissions.
- **High recovery.** Laboratory work in Houston has demonstrated greater than 90% iodine recovery and 99.8% purity iodine from Anadarko Basin produced water (see news release dated August 10, 2026).
- **Clean brine returned.** Brine leaves the process as a clean, usable stream suitable for disposal, reinjection or beneficial reuse.
- **Flexible integration.** The unit can draw raw produced water or, where a partner already treats water to specification, accept pre-treated clean brine directly.

The data is expected to support the front-end loading (FEL-3) feasibility study being completed by Fluor Corporation and the design of modular 200 tonne-per-year field units under the Company’s collaboration with Bayer AG.

Bringing Water Owners into the Program Now

Voyageur is active discussions with landowners, operators and midstream water companies in Oklahoma and the Permian Basin to

host subsequent field deployments of the pilot following the initial trial.

The Company invites oil and gas producers, saltwater disposal companies and midstream water companies to submit produced-water samples for iodine screening or to discuss hosting a subsequent field deployment of the pilot.

Producers and water owners can engage in two ways: submit a sample through the Brine Sampling Program described below, or contact the Company to discuss hosting a field deployment. Contact details appear at the end of this release.

Process Integration

Beneficial reuse of produced water, including desalination for discharge, and the recovery of other minerals from brine are rarely economic on their own. Voyageur believes the path forward is an integrated system in which the first process step pays for itself and covers the cost of the pretreatment that every downstream technology needs. In Voyageur's view, existing blow-out tower iodine production cannot do this economically.

The Mueller process is designed to be that first step. It runs as a slipstream and does not interfere with disposal, desalination or other downstream operations. Along with salable iodine, it returns a clean brine that can feed directly into other processes. It can share pretreatment and infrastructure with lithium and other critical mineral recovery, and its iodine revenue can help offset pretreatment costs and improve the economics of those operations. For water owners and midstream operators, this is designed to turn produced water from a disposal cost into a source of revenue.

A Laboratory Built for the Hardest Brines

Accurate measurement of iodide at parts-per-million levels in produced water is a recurring challenge for the industry. Oilfield brines often contain chloride at concentrations tens of thousands of times higher than iodine, along with bromide, dissolved organics, sulfide and suspended solids. These can bias common screening methods. Methods that report only total iodine also cannot tell operators how much of that iodine is present in the recoverable form.

To address this, Voyageur has installed an ion chromatography (IC) system, an analytical technique that separates and measures individual dissolved ions, configured specifically for iodine species in high-salinity brine. Combined with sample-preparation protocols developed for oilfield water, the system allows the Company to:

- Quantify iodide in high-chloride, high-bromide brines;
- Distinguish iodide from other iodine species, which shows how much of the iodine in a water source is recoverable;
- Track iodine through each stage of the process for accurate mass balance and recovery figures in both the lab and the field pilot; and
- Screen new water sources quickly, so operators can learn whether their water holds economic iodine.

The laboratory was brought from start-up to fully operational in under three months and is now running samples routinely.

Brine Sampling Program

Voyageur invites operators, SWD companies and midstream water companies to submit produced-water samples for iodine screening. Initial screening requires only 1 to 2 litres per source, which may be shipped by standard courier. Sources that show promising iodine levels can then be evaluated in larger volumes to assess

pretreatment needs. Voyageur treats all resulting data as belonging to the sample provider. To arrange a sample, contact Dr. Brian Mueller using the details below.

Management Commentary

“Completing the pilot plant moves the Mueller process from the laboratory to the wellsite. This is a built, field-ready unit, ready to connect to an operator’s produced water,” said Brent Willis, President and Chief Executive Officer of Voyageur. “Produced water in the U.S. holds various grades of iodine that is re-injected today. With a field-ready pilot and a lab that can accurately tell an operator what is in their water, we are bringing water owners into the program now. Early participants help shape the field deployment and the design of our modular units. We are building toward a domestic iodine supply for North American contrast media, from Earth to Bottle.”

“You cannot design a recovery process around a number you can’t trust,” said Brian Mueller, Ph.D., Director of Chemistry and inventor of the Mueller process. “Produced water is one of the hardest matrices there is for iodine analysis, so we built our lab around that problem from day one. Operators can courier us a 1 to 2 litre sample and get an iodide value they can make decisions with, including how much of their iodine is in recoverable form. The same analytics will verify every gram of iodine the pilot recovers in the field.”

About Voyageur Pharmaceuticals Ltd.

Voyageur, a Canadian public company trading under the symbol VM on the TSXV, is in development of barium and iodine Active Pharmaceutical Ingredients (API) and intends to offer high-performance, cost-effective imaging contrast agents. With a strategic focus on vertically integrating the barium and iodine contrast markets, Voyageur aims to become a key player by

producing its own barium and iodine. Voyageur has developed five barium contrast products that have Health Canada licenses.

Voyageur’s business plan is set to generate cash flow by partnering with established third-party GMP pharmaceutical manufacturers in Canada thereby ensuring the validation of its products by regulatory agencies worldwide. As Voyageur solidifies its presence in the market, it plans to transition into a high-margin domestic manufacturer of radiology drugs, further expanding its revenue streams.

At the core of its operations, Voyageur owns a 100% interest in the Frances Creek barium sulfate (barite) project. Currently, the world’s pharmaceutical barium sulfate is almost entirely synthetically produced which management believes results in a less effective imaging quality product. Voyageur’s Frances Creek resource boasts a rare and high-grade mineral suitable for the pharmaceutical marketplace that Voyageur believes will replace the current products with higher quality lower cost imaging products.

Voyageur’s ambitious vision is to become the first vertically integrated company in the radiology contrast media drug market. By controlling all primary input costs, from the sourcing of raw materials to final production, Voyageur intends to ensure quality and cost efficiency. With its approach, it embodies the motto of “From Earth to Bottle,” highlighting Voyageur’s commitment to responsible sourcing and manufacturing practices.

For further information, please contact:

Brent Willis, President and CEO – Brent@vpharma.ca

Brian Mueller, Ph.D., Director of Chemistry (technical and sampling inquiries) – Brian@vpharma.ca

General inquiries: info@vpharma.ca — www.voyageurpharmaceuticals.ca — Toll-free (877) 456-6241

Forward-Looking Statements

This news release contains “forward-looking information” and “forward-looking statements” within the meaning of applicable Canadian securities laws (together, “forward-looking statements”). Forward-looking statements are often, but not always, identified by words such as “plan,” “target,” “expect,” “intend,” “anticipate,” “believe,” “designed to,” “will,” “may,” “could,” “potential” and similar expressions. Forward-looking statements in this release include, without limitation, statements about: the mobilization of the pilot and the expected commencement of the first field trial in the first week of December 2026; the planned multi-site field trial program; the selection of sites for planned initial 1,000 tonnes per year and subsequent 2,000 tonnes per year of iodine production; the Company’s target of 3,000 tonnes per year of iodine production; the continued participation of those companies and the participation of additional producers and water owners; the selection of host sites, including priority consideration for early participants; the pilot plant’s deployment schedule; the expected issuance of patents on the Mueller process, including the initial patent expected in 2027; the deployment of the pilot plant and the selection of, and arrangements with, host sites; the outcome of the Company’s discussions with landowners, operators and midstream water companies in Oklahoma and the Permian Basin; the Company’s efforts to bring water owners into its program; the use of pilot data to support the FEL-3 feasibility study being completed by Fluor Corporation, and the completion, timing and results of that study; the design and deployment of modular 200 tonne-per-year field units under the Company’s collaboration with Bayer AG; the expected performance, recovery, purity, emissions and economics of the Mueller process

at field scale, including economic iodine concentrations as low as 80 ppm, the slipstream configuration, the clean brine stream, shared pretreatment and infrastructure with lithium and other critical mineral recovery, and iodine revenue offsetting pretreatment costs; the capacity, throughput and timing of the Company's laboratory and Brine Sampling Program; and the development of a domestic iodine supply for North American contrast media.

Forward-looking statements are based on assumptions management believes are reasonable as of the date of this release, including that companies currently working with Voyageur will continue to participate; that the sampling data and indicated produced-water volumes underlying the Company's target of 3,000 tonnes per year of iodine production are representative; that host sites and produced-water supply can be secured on acceptable terms; that the pilot can be scheduled and deployed as planned; that the pilot will perform in the field consistently with laboratory results; that patent applications will be examined and allowed as expected; that the FEL-3 study will be completed on a timely basis with favourable results; that the Company's collaboration with Bayer AG will continue; that financing will be available on acceptable terms; that required permits and approvals will be obtained; and that iodine prices and demand will support the Company's economics.

Forward-looking statements involve known and unknown risks, uncertainties and other factors that may cause actual results to differ materially. These include, among others: companies currently working with Voyageur may reduce or end their participation, and additional companies may not participate; the Company's target of iodine production is based on limited sampling and indicated produced-water volumes, is not a production forecast or a mineral resource estimate under National Instrument 43-101, may be revised and may not be

achieved; host-site selection may change, and the pilot's deployment schedule may be delayed, reordered or changed; the Company may not secure host sites, produced-water supply or other commercial arrangements; discussions with landowners, operators and midstream water companies may not result in agreements; field results may differ from laboratory results, including recovery, purity and operating costs; the pilot may experience technical, mechanical or logistical delays; patents may not issue, may issue later than expected or with narrower claims, or may be challenged; the FEL-3 study may be delayed or may not support further development; Bayer AG has not committed to fund or build out modular units or to purchase iodine, and the collaboration may not lead to deployment or offtake; the Company may be unable to obtain financing needed to build modular units or to recover iodine at commercial scale; iodine prices, demand and produced-water iodine concentrations may be lower than expected; sample volumes or laboratory capacity may affect screening timelines; regulatory, environmental and permitting requirements may change; and the other risk factors described in the Company's continuous disclosure documents filed on SEDAR+ at www.sedarplus.ca. The Company's target of 3,000 tonnes per year of iodine production is not a production forecast and should not be read as a forecast of production or revenue.

Readers are cautioned not to place undue reliance on forward-looking statements. The forward-looking statements in this release are made as of the date of this release, and the Company does not undertake to update them except as required by applicable securities laws.

Neither TSX Venture Exchange nor its Regulation Services Provider (as that term is defined in the policies of the TSX Venture Exchange) accepts responsibility for the adequacy or accuracy of this release.