

Reference Project

Clarifying Freshwater on the
Sabine River

An operator looked for modern alternatives as a commodity chemical became less reliably available and economical.

Background: Companies that rely on freshwater clarification for reverse osmosis, ion exchange, process water, feedwater, or cooling towers are concerned about the shortages and increasing cost of polyDADMAC. It's becoming less reliably available and economical, driving interest in other options that allow operators to reach their KPIs.

The problem: On top of increasing supply challenges with polyDADMAC, a refinery on the Sabine River has been unable to maintain its turbidity KPI to <5 NTU making it necessary to constantly supervise the daily fluctuations.

↳ Though they use a sludge blanket clarifier system, it's been difficult maintaining the sludge blanket itself to mitigate carry over.

The solution: We tested the performance of to help the refinery fully transition from relying on polyDADMAC.

The results: Tests consistently result in better clarity with lower NTUs over a wider range of dosing. We saw faster flocculation with lower dosing than commodity dry or emulsion polymers due to SimpleFloc's pre-made-down state.

The bottom line: The switch from polyDADMAC to SimpleFloc + ACH created better KPIs while reducing manpower, the chance of spills and HS&E incidents, and emissions.

Footnote: SimpleFloc not only improved clarification, but delivered additional benefits:

- Crews were more efficient as they didn't have to babysit make-down
- Significantly less chemicals were introduced into the operating envelope, ensuring no permits were breached
- Crews enjoyed safer working conditions not having to deal with dry make-down dust or slips from emulsion slop

RESULTS

- Removed need for polyDADMAC
- Reduced chemical costs by 50%
- Boosted crew efficiency
- Reduced HS&E incidents

CarboNet: As freshwater becomes increasingly scarce and regulated, companies from energy and mining to food and beauty turn to CarboNet to reduce, recycle, and renew the water they need to compete.

Water Clarification

Low-emission clarification that's fast, efficient, and safe.

Clarification without ramifications.

Water treatment operators, faced with capped emissions and fixed CAPEX/OPEX, live with a Catch-22:

- ↳ **To comply with emission caps**, crews often under-dose PAM, leading to weak flocs and, in reaction, last-minute overdosing in an attempt to recalibrate.
- ↳ **Inconsistent dosing** gums up the filters and need to be swapped out or backwashed, leading to an increase in OPEX or CAPEX.

Why this matters: costs and caps only go up while budgets stay put or go down, leaving operators in no-win scenario.

CarboNet chemistry recalibrates the issues and provides operators with more affordances. SimpleFloc, our no-make-down solution for water treatment:

- ↳ **Cuts PAM by 80%**, creating an expansive buffer that all-but-guarantees crews won't overdose and breach limits.



↳ **Requires no make-down** and plugs directly into the system, eliminating the need for make-down equipment and maintenance.

↳ **Offers a forgiving dosage window** so workers don't have to babysit the pumps or experiment with complex dosing regimes.

↳ **Reduces NPT** due to backwashes and swap-outs, and cuts HS&E incidents due to inhalation (dry polymers) or falls/breaks (emulsion slop).

↳ **Fundamentally lowers your cost-to-treat** by nearly eliminating PAM and permit breaches; and reducing OPEX, CAPEX, and NPT.

The bottom line: Operators can re-write the plot by modernizing their chemistry to eliminate make-down, reduce OPEX and CAPEX, and live comfortably within emission caps.

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SimpleFloc

Anionic Flocculant

CarboNet SimpleFloc is a pre-activated flocculant that is dosed neat without dilution or make-down required—for a streamlined and simplified process.



TECHNICAL SPECIFICATIONS

PRODUCT	3010A-G3	3030A-G1
Charge density	-10	-30
Molecular weight	Very high	Very high
Specific gravity	1.01 – 1.04	1.01 – 1.04
Bulk viscosity *	6000 – 8000 cP	4000 – 6000 cP
pH	7.5 – 9.5	7.5 – 9.5
Storage Temperature	41 – 86°F (5 – 30°C)	41 – 86°F (5 – 30°C)
Shelf life **	6-12 months	6 months
Appearance	Opaque gel	Opaque gel
Color	Milky white	Milky white
Odor	Mild	Mild
Freezing point	32°F (0 °C)	32°F (0 °C)
Boiling point	212°F (100°C)	212°F (100°C)
Reactivity	Non-flammable, non-reactive, stable	

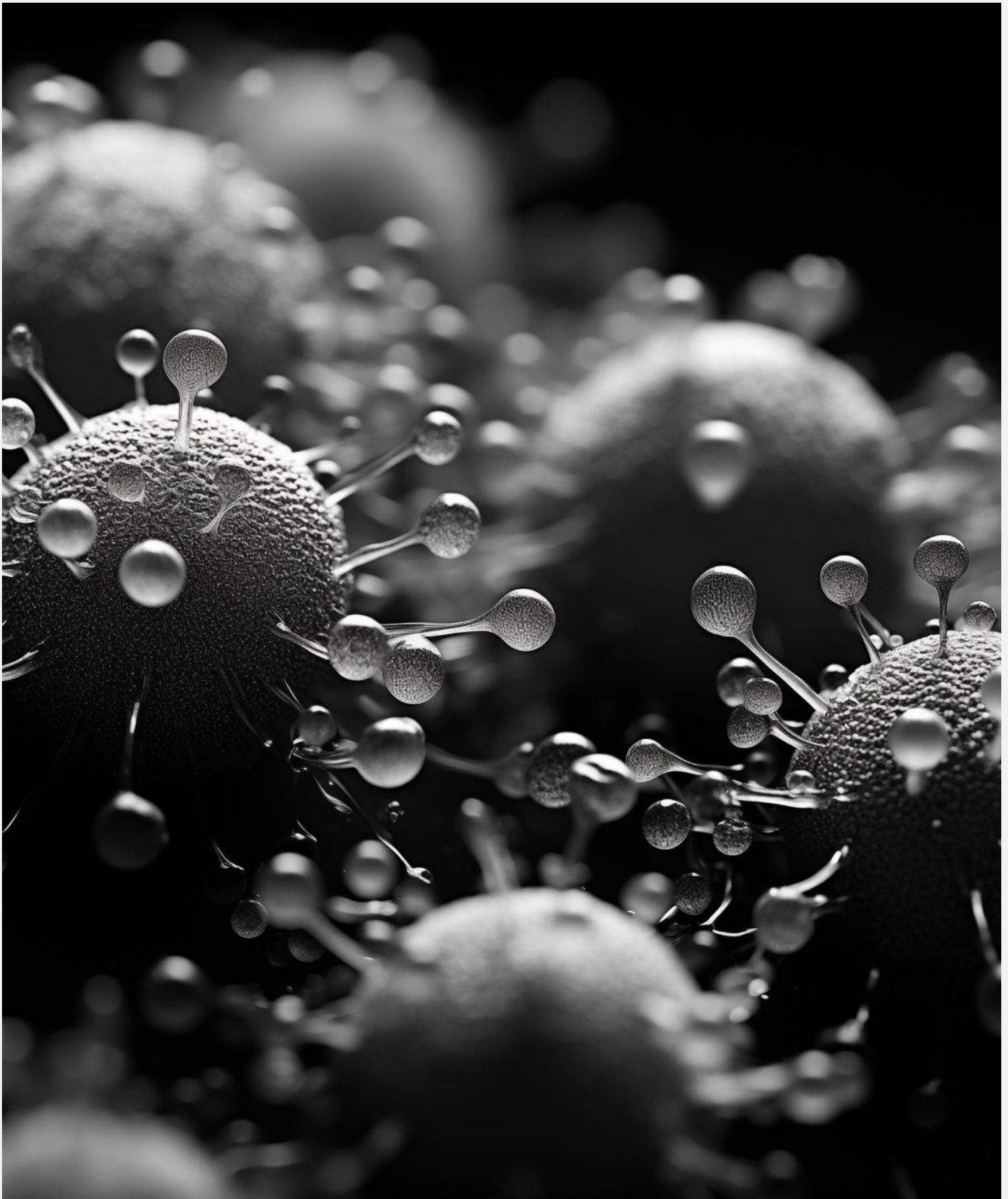
APPLICATIONS

- Groundwater treatment
- Influent water clarification
- Produced water reuse
- Phosphate removal
- Wastewater

Note: Anionic SimpleFloc™ is best suited for waters containing cations [Ca²⁺, Fe²⁺/3⁺, Al³⁺, and Fe(OH)₃], positively charged particles, and oil. In many cases, the cationic load is provided by the upstream coagulant.

* Average values measured at 60 rpm
**When stored inside at stable temperature of 72-86°F





NanoNets

The platform behind the products.

A machine to make machines:

NanoNets are a proprietary library of molecular agents that can sequester particles in water 10x more efficiently than industry norms at a fraction of the price.

How it works: NanoNets mix a targeting surfactant with a scaffolding polymer:

↳ **Surfactant:** The glue that helps the flocculant attach to particles or impurities in water. It's responsible for ensuring the flocculant can find and stick to the target particles.

↳ **Polymer:** This gives the flocculant its shape and stability. Just like the frame of a house provides support and structure, the polymer ensures the flocculant can hold together and effectively do its job.

A bit deeper: Together, and guided by AI, these components behave like a programming platform, capable of outputting an array of products to address any water treatment application.

Why it matters: Water insecurity is changing regulations and emission limits. Commodity chemicals like polyacrylamide (PAM)—created 70 years ago for a different era of water treatment and rapidly aging out—aren't up for the task at hand:

↳ **Chemically,** PAM has weak bonds that won't create strong flocs, often forcing wastewater teams to overdose and breach permit levels.

↳ **Technically,** crews have to constantly babysit make-down equipment to ensure PAM is properly dosed. When they miscalculate, they gum up bags, belts, presses, or centrifuges and the site or plant has to shut down for flushes or equipment swaps.

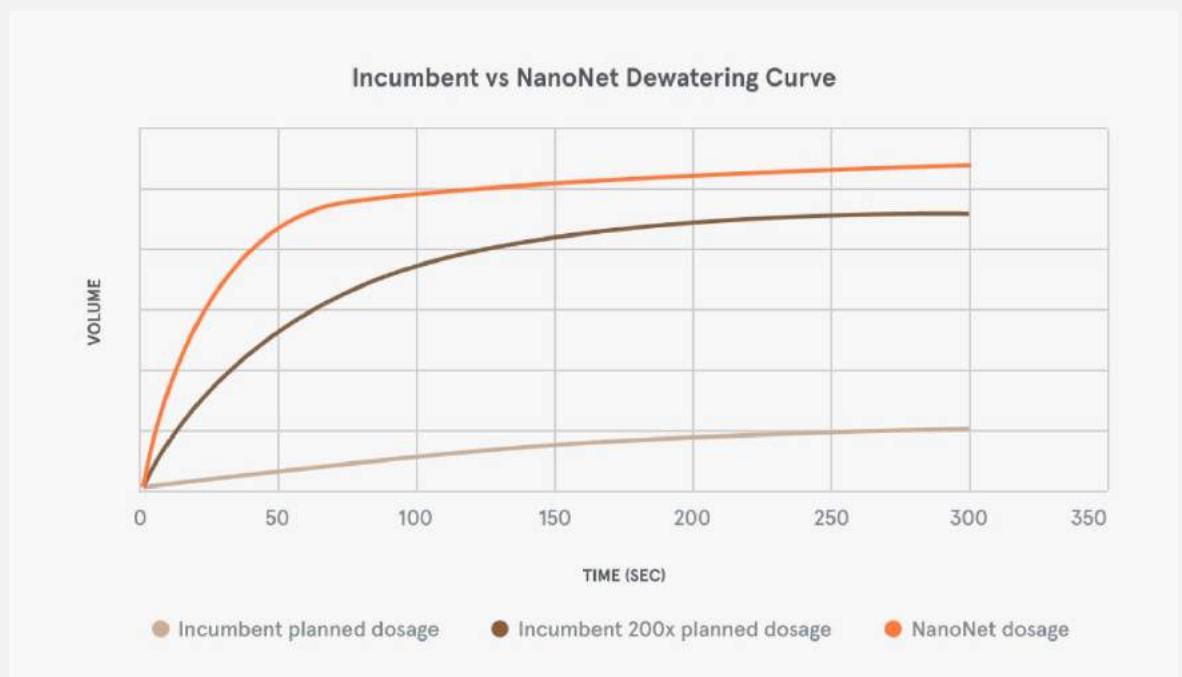
↳ **Practically,** PAM is dangerous: crews regularly suffer from inhalation burns (dry) and slips and breaks (emulsion slop).

↳ **Legally,** PAM heightens profile risk. A site overburdened with PAM will inevitably see seepage, spills, and dosing miscalculations push too much chemical into the environment and breach EC50/LC50 limits.

↳ **Financially,** PAM hits the bottom-line several times over, from the chemical costs to CAPEX purchases and maintenance to OPEX inefficiencies.

NanoNets in action:

SimpleFloc's pre-activated, made-down state faces no rate-limiting on speed of reaction compared with dry, emulsion, and solution polymers that must reckon with improper aging, variable water temperature, and dozens of other factors that impact performance.



In contrast: NanoNet chemistry resets the boundaries and can have a big impact on the P&L:

↳ **Chemical spend:** CarboNet flocculants alter the throughput of water treatment, reducing cost-to-treat by up to 50%.

↳ **OPEX:** CarboNet chemistry requires no make-down and dramatically reduces time spent on dosing calibration and monitoring. And, increasingly, NanoNet sites use automated pumps that send data back to a monitoring dashboard for aggregation and analysis.

↳ **CAPEX:** CarboNet flocculants don't require make-down equipment and often improve the performance of other tools in the pipeline, helping maintain existing CAPEX or avoid new investments entirely.

↳ **Toxicity:** NanoNets reduce PAM by up to 90%, helping hit increasingly stringent regulatory targets.

↳ **Emissions:** NanoNet chemistry reduces Scope 3 Emissions up to 70%. To date, the commodity chemicals we've displaced has cut 300 million tonnes of CO2 production.

↳ **Health & safety:** CarboNet products arrive pre-activated and plug-and-play, removing the need for makedown and crew exposure to toxic inhalants, spills, slips, and other machine interactions.

↳ **Regulatory exposure:** Broadly, CarboNet chemistry slashes emissions and improves performance KPIs related to zero discharge or permit targets

CarboNet: As freshwater becomes increasingly scarce and regulated, companies from energy and mining to food and beauty turn to CarboNet to reduce, recycle, and renew the water they need to compete.

Behind-the-scenes: CarboNet scientists and field technicians are focused on products for a new reality: a world with less water and more regulations—but persistent demands of customers and shareholders.

↳ This has led to the NanoNet platform and new chemistry, one which eliminates chemicals from water treatment entirely, another that isolates valuable particles for extraction.

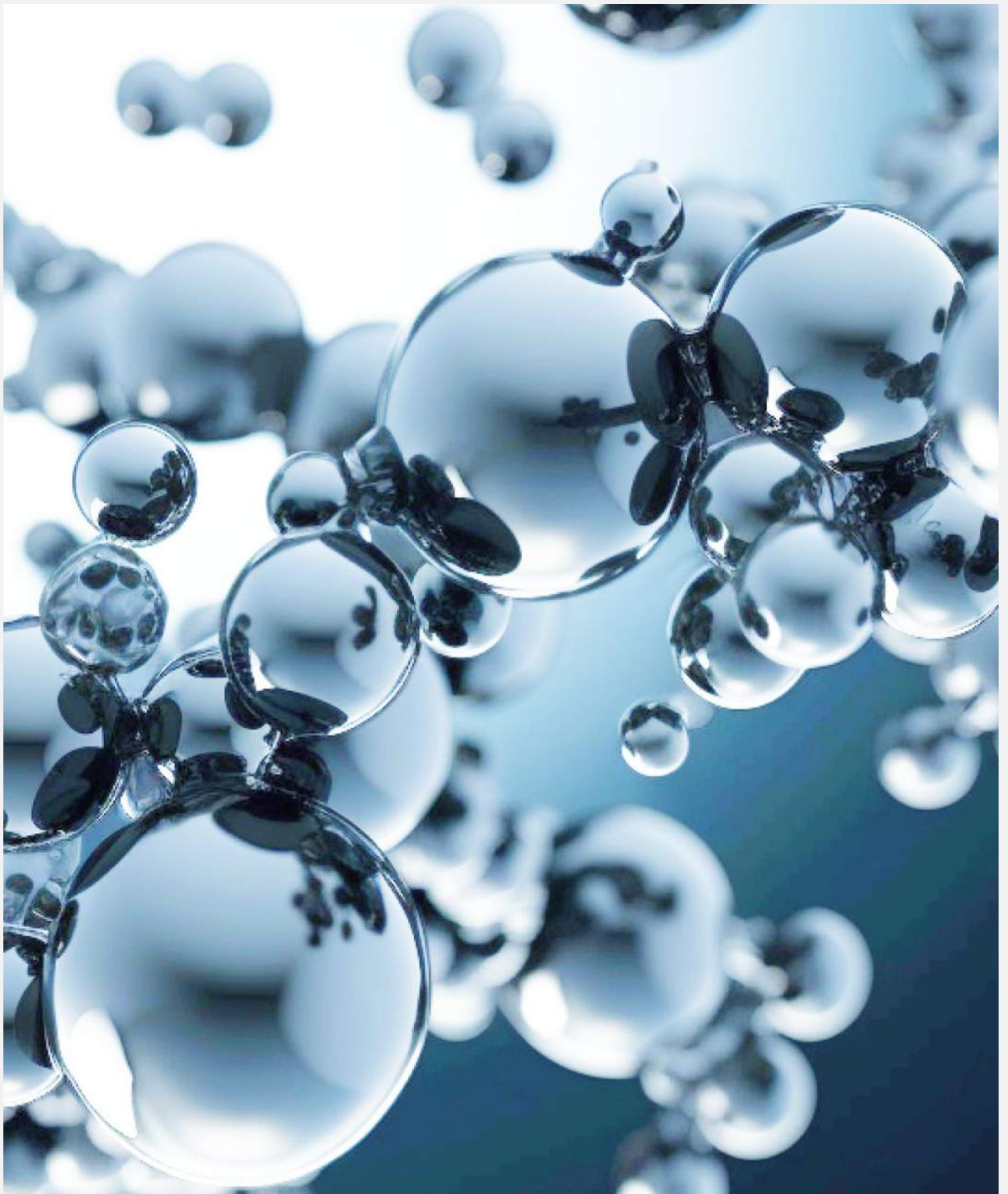
The bottom line: Water treatment has moved from a line item in the P&L to a key strategic advantage for companies looking to boost profits as they navigate regulatory hazards and the increasing costs of freshwater.

↳ **Smart chemistry** can reduce drawdown, recycle wastewater—even reclaim waterborne materials—while cutting costs and improving unit performance.

“It’s the most technologically innovative water treatment application I have laid eyes on this decade. It has been excellent in helping our project operate within spec, and in simplifying our overall process. It’s the difference between a system that just meets regulations and one that’s set up to accelerate and scale.”

Randy Khalil

Dewatering & Water Treatment SME



OVERVIEW

Chemistry to Compete

CarboNet ••

As freshwater becomes scarce and increasingly regulated, companies from energy and mining to food and beauty turn to CarboNet to reduce, recycle, and renew the water they need to thrive.

Adaptive chemistry: a new competitive advantage.

CarboNet's NanoNet platform generates programmable flocculants, coagulants and targeting agents that adapt to any application and significantly impact your P&L and market position.

CHEMISTRY FOR THE P&L

Chemical spend

Reduce cost-to-treat by up to 50%

Toxicity & emissions

Reduce PAM by up to 90%

OPEX spend

Greater crew efficiency, reduced NPT, lower labour costs

CAPEX investments

Avoid new equipment, prolong existing infrastructure, increase throughput

Regulatory exposure

Reduced exposure to govt or collective action



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Products

CarboNet chemistry is powered by NanoNets, novel molecules that sequester particles 10x more efficiently than industry norms at a fraction of the price.

- SimpleFloc Anionic [↗](#)
- SimpleFloc Cationic [↗](#)
- NanoNet Select [↗](#)



Applications

CarboNet chemistry is designed to adapt to most applications and water conditions.

- Leachate [↗](#)
- Meat & dairy [↗](#)
- Groundwater [↗](#)
- Personal care wastewater [↗](#)
- Produced water [↗](#)
- Sludge dewatering [↗](#)
- Water clarification [↗](#)



Industries

Products for industrial brands and operators across industries and applications:

- Construction [↗](#)
- Food & beverage [↗](#)
- Mining [↗](#)
- Municipal [↗](#)
- Oil & gas [↗](#)
- Pharmaceutical [↗](#)
- Pulp & paper [↗](#)



About Us

Five-years in, CarboNet has set the standard in modern water chemistry and set their sites on major North-American markets.

- About us [↗](#)
- Leadership [↗](#)
- Careers [↗](#)
- LinkedIn [↗](#)

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