



## High Liner Fishery Products Danvers, Massachusetts

Based in Danvers, Massachusetts, High Liner Fishery Products is a leading supplier of quality fresh and frozen seafood products. Specializing in cod, flounder, sole, salmon, tilapia, perch, crab, coldwater shrimp, warm water shrimp, scallops and lobster. High Liner Fishery Products has more than 150 value-added fish and shrimp products.

With value-added production facilities in both Massachusetts and Newfoundland and a major distribution centre in Massachusetts, High Liner Fishery Products boasts the most seafood processing technology and distribution capabilities in the industry.

### THE CHALLENGE

High Liner Fishery Products fish processing plant, located in Danvers, Massachusetts, was experiencing challenges with their existing wastewater treatment system based on conventional trickling filter technology. The plant was generating a myriad of problems, including plugging, flies, and even odor complaints from neighboring residents.

Fish smells aren't that popular, especially smells from a fish processing plant. Management knew they had to take action, so they began to search for an alternative technology. What they required was a system which would not only eliminate these problems, but also be expandable, fit within the old plant's footprint, and be simple to operate. In addition, the nature of the business required that the processing plant operate 350 days/year with a two week shutdown in July. The challenge was then also to provide and install the new system within a two week window. Enter Headworks Bio.

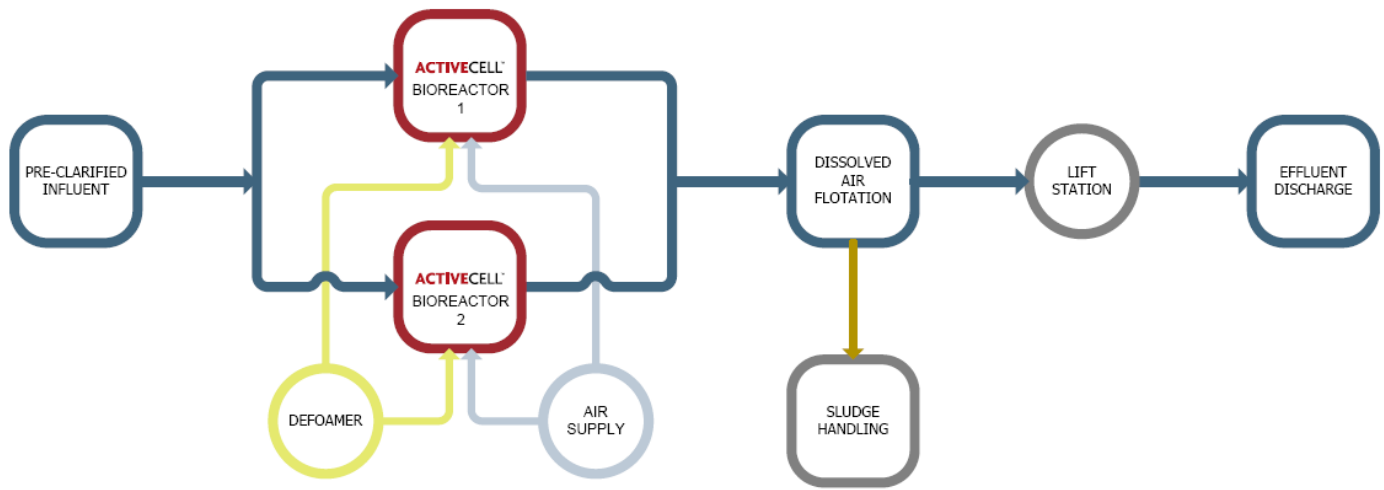
### Fishery Products Fast Facts

Wastewater Flow	72,000 gpd
BOD <sub>5</sub>	Design Influent < 1500 mg/L Effluent Req. < 250 mg/L
Total Suspended Solids	Design Influent < 100 mg/L Effluent Req. < 250 mg/L
FOG	Effluent Req. < 100 mg/L
Temperature	< 30 C
pH	6.5-8.0

*"The ability to treat our wastewater without generation odors was the main challenge that we have faced with this project. Headworks Bio has met and exceeded all of our goals and discharge limits. Everyone is breathing much easier now, including our neighbors."*

- Frank Gochakowski, Jr.  
 Operations Supervisor, High Liner Fishery Products





## THE ACTIVECELL SOLUTION

The unique and highly effective Moving Bed Biofilm Reactor ("MBBR") system proposed by Headworks Bio (formerly known as Hydroxyl Systems Inc.) would fit the requirements of the plant by fitting within the existing footprint while still allowing for expansion, meet effluent requirements, reduce odors, and be straightforward to operate.

Wastewater from Fishery Products' seafood processing facility flows by gravity from floor drains and rotary screens to a below grade wastewater collection tank. The wastewater is then pumped to a 40,000 gallon equalization (EQ) tank that is continuously agitated with a PD Blower and an air sparging system. The process stream is pumped at a controlled rate to a pre-dissolved air flotation (DAF) system where total suspended solids (TSS) as well as fats, oils, and grease (FOG) are flocculated, coagulated and separated. The clarified wastewater is then directed to a 3,000 gallon collection sump and transferred to the ActiveCell biofilm carrier systems by flow controlled transfer pumps. Suspended solids removed by the DAF system are pumped to a sludge holding tank for pick-up by a rendering operation.

Clarified wastewater is then biologically treated via the ActiveCell biofilm carrier process incorporating two 10,000 gallon ActiveCell bioreactor tanks operating in parallel configuration. The ActiveCell process biodegrades wastewater using thousands of suspended biofilm carriers that operate in a continuously mixed, aerated environment. Each biofilm carrier provides an active surface area sustaining heterotrophic and autotrophic bacteria within protected cells.

This dynamic population of bacteria achieves high-rate biodegradation productivity within the system, while also offering process resiliency and automated operation.

Inactive microorganisms within the ActiveCell process are continuously sloughed from the biofilm carriers and exit the bioreactors via a wedge wire retaining screen in the form of total suspended solids (TSS) with the treated effluent. This continuous sloughing action exposes the biofilm to the organic load in the wastewater and provides a self-regulated high-rate biological treatment process that is responsive to load fluctuations.

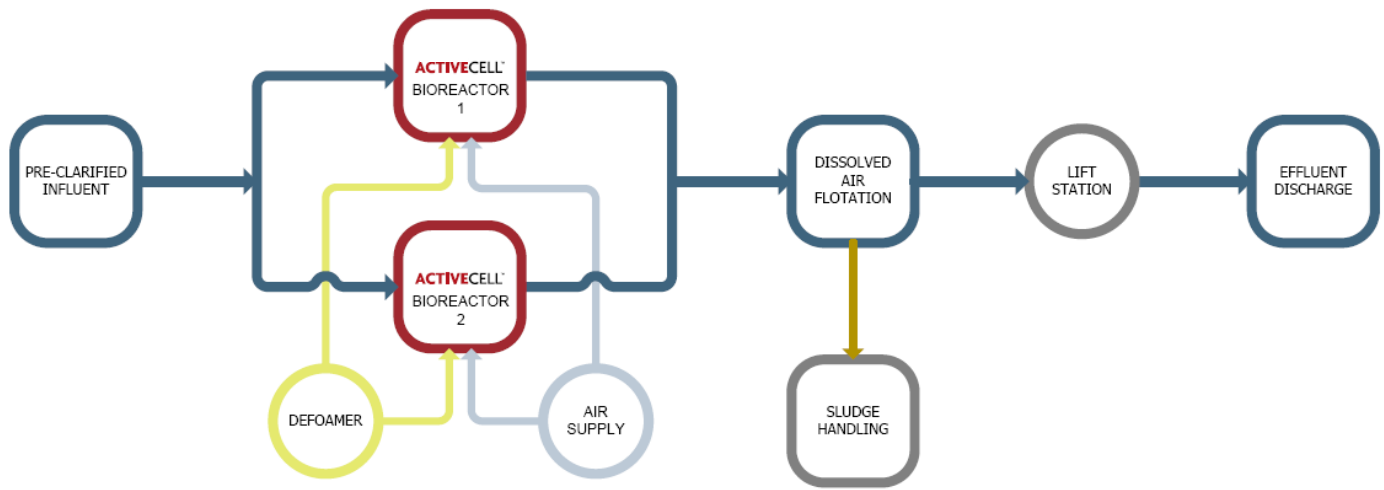
Treated wastewater flows from the ActiveCell system by gravity to a Headworks Bio dissolved air flotation (DAF) system located in a climate controlled process control building where total suspended solids (TSS) are removed from the process stream. Solids accumulate on to the surface of the water within the DAF, and a mechanical flight and chain assembly slowly skims the surface of the water to a sludge holding chamber.

## WATER RESULTS

Treated and clarified wastewater is collected in a lift station and pumped to a Parshall flume for flow and pH monitoring prior to being discharged to the sewer drain for effluent discharge to the Essex County Wastewater Treatment Plant, meeting the target effluent quality standards of <550 mg/L BOD and <mg/L TSS.



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And the two-week window for installation? Everything went as planned and the plant reopened after their shutdown period on time ready to go. The system was turnkey-installed and started up soon afterwards. Approximately two weeks following system start-up, the system was already reaching the prescribed effluent quality targets. System performance has surpassed design criteria, despite varying influent conditions (namely flow and lack of nutrients).



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