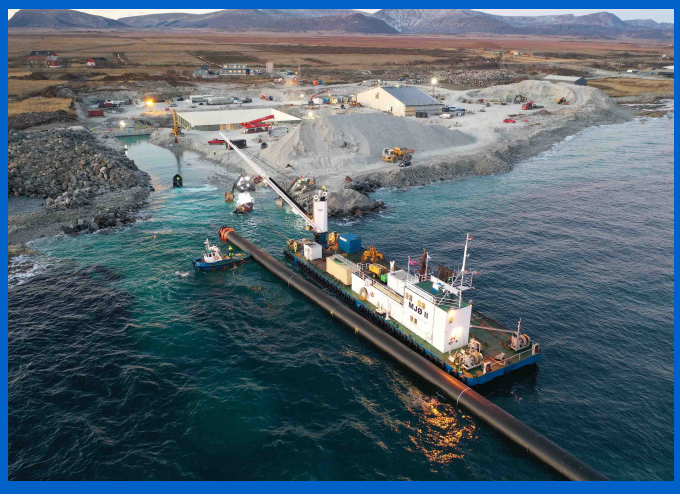
References

Fish farming with the smallest possible footprint



Uponor involvement

- Weholite PE-pipe, ID1 800 mm and ID 2 200 mm.

Fish farming with the smallest possible footprint

Andfjord Salmon AS, a Norwegian fish farming company, has the ambition to create a sustainable, environmentally and fish-friendly onshore facility – with the smallest possible footprint. This patented facility combines the best from both traditional ocean net-pens and land-based salmon farming. The intake and outfall lines are built with highly durable Weholite PE pipes and panels with a 100-year life span.
Andfjord Salmon's fish farming facility is located on Andøya, the northernmost island in the Arctic Archipelago of Vestrålen and Lofoten in northern Norway. Established in 2014 by Roy Bernt Pettersen, the company is built on innovation in sustainable salmon farming. Its vision is to build a futureoriented facility based on sustainable development of the aquaculture industry.

The facility's patented design is based on a seawater flow-through system, combining the best from both traditional ocean net-pens and land-based salmon farming. It is a closed land-based facility that has been lowered to sea level on land. The plant has 100% flow, with continuous renewal of fresh seawater – it thus differs from traditional land-based facilities, which are based on recycling with purification of water.
"In the pools, the salmon have plenty of space and pure, oxygen-rich water. This ensures optimal growth conditions for salmon," says Martin Rasmussen from Andfjord Salmon.

The optimal temperature from the Gulf Stream

The most significant advantage of Andfjord Salmon's facility is the infinite supply of nutritious, clean and oxygenrich seawater, with optimal and stable temperatures in the Arctic. Just off the coast of Andøya island, the Gulf Stream flows north. At no other point on this extremely long coastline does the life-giving current reach closer to land than at this island. The fresh seawater in the fjords off Andøya maintains the perfect temperature for Atlantic salmon, which positively thrives in these waters. That's the reason why Andøya's location makes it uniquely suited to salmon farming.

Andfjord Salmon does not need to heat or cool the water. The optimal temperature from the Gulf Stream, between 7 and 12 degrees Celsius, ensures that salmon are content and grow continuously, year-round.
Water from the Gulf Stream passes through the pools up to 15 times per day. Seawater is pumped from 160 or 30 metres, depending on whether it is winter or summer season.

"We collect the water at a great depth, far below the levels where salmon lice and hazardous algae thrive. This is a huge advantage, as one of biggest challenges in the fish farming industry is the treatment of sea lice," says Rasmussen.

Since the onshore pools also lie below sea level, Andfjord Salmon's flow-through technology consumes a minimal amount of energy and the operating costs are relatively low, too.

Also, minimising the environmental impact is essential. Valuable biological residue is collected, and can then be utilised in a circular way to produce bioenergy and electricity as well as agricultural fertilisers.

A highly durable solution

Uponor has supplied the complete intake and outfall pipeline systems for the onshore pool. The pipelines are built with Weholite PE pipes in ID1,800mm and ID2,200mm and the special components with Weholite panels. The highly durable panels are used, for example, for the intake screen, which is installed at 40 metres depth. Weholite panels and pipes developed by Uponor Infra can be dimensioned and equipped individually for countless applications, such as tanks, foundation slabs, support structures, underground pumping station chambers, and floating or submerged marine structures.

Uponor's collaboration with Andfjord Salmon started in early 2018 when the facility in Andøya was under planning. Work at the site started in 2020 and now the last part of phase 1 at the plant is completed.

"We have had many project meetings with the consulting company Norconsult and the other suppliers to find the optimal solutions for the facility. Uponor has long experience in industrial solutions. We have supplied intake and outfall pipelines to customers around the world, but this was our first solution for a land-based fish farm," says Christian Vestman from Uponor Project Services and Geir-Are Berg from Uponor Infra AS.

Project Facts:

Location	Completion
Andøya, Norway	2022
Building Type	Product systems
Industrial	Tailor made constructions

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