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Mining waste may be too sharp for Norwegian fjord marine life

The size and shape of waste from Norway's mining activities may be limiting the recovery of marine life in the fjords, a new study shows.

During mining, a waste product is produced from leftover rock particles, called tailings.

While dumping tailings into the environment is largely illegal across Europe, in Norway companies commonly apply for a licence to send the slurry directly into deeper parts of the fjords that are adjacent to their mines.

The tailings cause major changes to the fjords' natural environment by covering the existing seafloor animals. The result is a fine-grained seafloor without life and devoid of the organic material that marine organisms need to feed on.

Previous reports suggested it could take decades before fjord ecosystems recover from mining waste.

One possible solution is to enrich these tailings with organic matter for marine life to feed on and assist the seafloor's recovery.

A new report in *Frontiers in Marine Science* has found that this method is ineffective.

Professor Andrew K. Sweetman from the Lyell Centre, a strategic partnership between Heriot-Watt University and the British Geological Survey, said: "Our research indicated that it's the presence of mine tailings that keep marine organisms away, not really the lack of food.

"At our test sites we added organic material to tailing sediment. If a small amount of material was added there was a small positive effect on the animal community, but even after one year there wasn't a full recovery. When we used a lot of organic material, it was even worse.

"The abnormal grain size had a significant effect on the recovery rates and the shape of the tailings were also possibly an important factor impeding the recovery.

"The grains in mine tailings have different sizes and very sharp edges compared to ordinary marine sediments like naturally occurring sand and clay.

"As the animals living at the seafloor predominantly eat through the sediments to find food, this can lead to internal damage."



The Norwegian Pollution law demands rehabilitation of marine tailings after decommissioning to help the fjord seafloor recover to a good environmental state. Sweetman says his team's research proves new standards are required.

"Mining companies cannot rehabilitate the marine environment of the fjords by just adding organic materials to the top layers of the waste.

"A better method would be to ensure that the tailings are ground down to appropriate sizes and shapes, which of course could lead to increased costs for mines as they approach decommissioning."

Dr. Barbro Taraldset Haugland currently at the Institute of Marine Research in Bergen, Norway said: "Our results are very interesting, as every step towards understanding the mechanism behind how mine tailings influence nature gives us better tools to maintain healthy fjord ecosystems."

The research was funded by the Norwegian Research Council.

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Notes to Editors

The Lyell Centre

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