

# **THE IMPACT ON WATER QUALITY AND MARINE ENVIRONMENT IN COPENHAGEN HARBOUR AND ØRESUND**

## **ABOUT LYNETTEHOLM**

On 4 June 2021, a broad political majority in the Danish Parliament passed the act on the construction of Lynetteholm. Lynetteholm will be constructed as a peninsula between Refshaleøen and Nordhavn with a coastal landscape facing Øresund, which will help protect Copenhagen from storm surge from the north. CPH City & Port Development will create the land area on Lynetteholm by utilising - in other words, recycling - surplus soil from Copenhagen and construction projects in and around the city.

Prior to Parliament's decision to construct the land area of Lynetteholm, environmental impact assessments were drawn up, illustrating how it is believed the construction of Lynetteholm will impact the surrounding environment. CPH City & Port Development will continuously monitor the construction work, thereby ensuring all environmental considerations.

The signatory parties to the agreement decided to initiate a strategic environmental assessment (SEA) of the future plans for Lynetteholm, which have not yet been politically decided.

## **EXISTING POLLUTION ON THE SEABED AT LYNETTEHOLM**

Lynetteholm will be created in a marine area, which, for a large part of the history of Copenhagen Harbour, was used for dumping waste, and which, due to flow conditions, has deposited xenobiotic substances and heavy metals. The seabed in the area is soft and, in order to provide the dams on Lynetteholm's perimeter with sufficient stability, it will be necessary to remove the soft seabed by dredging, and then replace it with sand, where the perimeter is constructed. Further dredging of a small amount of seabed material will be required in order to deepen the fairways south of Middelgrunden and in Kronløbet.

The other part of the seabed material to be dredged is contaminated and will be deposited in the existing harbour sludge depot on Refshaleøen. The rest of the seabed contamination under Lynetteholm will be encapsulated with soil fill. The creation of Lynetteholm will thereby help remove and control existing contamination in Copenhagen Harbour.

## Fact sheet - The impact on water quality and marine environment in Copenhagen Harbour and Øresund

Updated November 2021

### THE IMPACT OF DREDGING SEABED MATERIAL ON WATER QUALITY

During the construction phase, it is estimated that the dredging of the soft seabed material will be the activity that most affects water quality, given that a small amount of the material (less than 5%) will spill and spread in the water.

A total of approximately 2,5 mio. m<sup>3</sup> of seabed material will need to be dredged. As described above, the upper part of the seabed material is contaminated. After dredging it will be disposed of in the existing harbour sludge depot on Refshaleøen. The lower part of the seabed material will be disposed of at two selected disposal sites in the sea south of Amager, about 25 kilometres from Køge. This seabed material consists predominantly of clean seabed material and a small part of slightly contaminated seabed material. The slightly contaminated seabed material is within the limits set by the environmental legislation on disposal, and may therefore be disposed of.

Disposal entails loading the dredged seabed material onto barges at Lynetteholm. The barges have flaps in the bottom that slide open at the selected disposal sites, so the seabed material falls to the bottom. (Read more about how the disposal will take place in the fact sheet '*Disposal of seabed material in the Baltic Sea and flow in Øresund*').

All dredging work will be conducted during the winter, when the biological activity in the marine environment is low: in other words, outside the growing

season, so that plants and animals will be minimally affected by the dredging work.

The so-called Lynetteholm 'implementation report' stipulates conditions for the dredging and disposal of the seabed material, so as not to exceed the applicable environmental quality requirements.

The spread of seabed material will be concentrated around Lynetteholm's perimeter with flags along the fairways. For a three-year period during construction, off and along the coast there will be periodic and temporary spreading of sediment up to the north of Taarbæk and to the south down to Dragør. The spread is estimated to contain up to 2 mg/litre of sediment, which is barely considered to be visible, and it will be for very short periods of time.

### BATHING WATER QUALITY

The Lynetteholm environmental impact report concludes that the bathing water quality in the Copenhagen Harbour and along the coast north and south of Lynetteholm will be unchanged, both during and after the creation of Lynetteholm.

The assessment is also that the construction of Lynetteholm, including soil fill, deepening of fairways and the disposal of seabed material, will not affect the goal of a positive ecological and chemical condition for the Øresund North water area or the goal of a positive ecological and chemical condition for the Køge Bay water area.

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## DISCHARGE OF SURPLUS WATER WHILE LYNETTEHOLM RECEIVES SOIL

Once Lynetteholm's perimeter is established, Lynetteholm will function as a large basin filled with water. From 2023, when Lynetteholm can start receiving soil, surplus water will be pumped from the 'Lynetteholm Basin' into the water around Lynetteholm, and water will be forced out through the dams. The water will be pumped out via a pumping station to the east in the stream around Middelgrunden.

The surplus water will be affected by the content of metals and organic, pollutants from the soil will be used for refill for Lynetteholm. The volume of the Lynetteholm basin is so large that material in the surplus water will settle before it reaches the pumping station,

or be retained in the sand core of the perimeter structure. In other words, only a small proportion of the pollutants will be carried with the surplus water into Øresund. As it is the same type of soil that has been received in the soil depot in Nordhavn until today, experience figures from this have been used to assess the pollution impact from Lynetteholm. CPH City & Port Development's advisors have investigated, and assessed that the environmental impact of pollutants, including heavy metals, from discharge and leakage of surplus water, is significantly lower than the environmental impact that currently comes from the Nordhavn depot. The discharge from Lynetteholm will thus comply with the applicable environmental quality requirements, and the impact on water quality will therefore be negligible.



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### **IMPACT ON MARINE NATURE**

Where Lynetteholm is established, areas of benthic flora and mussel banks will disappear. The composition of benthic flora and fauna under the area of Lynetteholm is common in Øresund. Consequently, the environmental assessment estimates that the construction of Lynetteholm will only have a minor impact on marine nature and, therefore, not affect the food base for fish and birds.

### **EELGRASS**

Lynetteholm has deliberately been designed and located in an area with no major occurrences of eelgrass. Thus, only a small part of the south-western corner of Lynetteholm will cover existing, dense deposits of eelgrass (*see the map on the previous page*).

West of Lynetteholm, there is an area of dense eelgrass, and there is a larger area around Middelgrunden, but Lynetteholm will not affect this.

The eelgrass deposit at Trekroner will be affected by the deposit of so-called sediment from the seabed material as a result of excavation during the construction phase. The environmental impact report assesses that the eelgrass areas are expected to recover within a few years, so the impact will not last. It is not believed that there will be any impact on the eelgrass deposits from environmental pollutants.

The total environmental impact on eelgrass, other flowering plants and macroalgae (seaweed) due to the spread of sediments during construction is considered to be small. It only constitutes

a negligible part of the total occurrence in Øresund, and because it is a reversible impact, the eelgrass will recover from the impact of excavated seabed material.

CPH City & Port Development expects 2-3 hectares of eelgrass and other benthic vegetation to be covered by Lynetteholm. To replace this, CPH City & Port Development will plant twice as much eelgrass in Copenhagen Harbour - in other words, just over 5 hectares.

Before the construction work begins, CPH City & Port Development will organise a monitoring programme for the environmental condition of the aquatic environment, and the benthic flora and fauna, to ensure that the construction of Lynetteholm complies with the environmental assessments that have been conducted.

### **NEW COASTAL LANDSCAPE AND PARTNERSHIP FOR MARINE BIODIVERSITY**

The creation of Lynetteholm's rock and gravel dams and a coastal landscape facing Øresund will add hard surfaces to create a reef-like effect with pebbles, large rocks and sandy beaches, where new occurrences of macroalgae and mussel banks can be developed. Mussels and other flora and fauna will be able to attach themselves to the rocks.

CPH City & Port Development has also entered into a partnership with the WWF for the development of the marine environment in Copenhagen Harbour. The partnership will investigate various options for further initiatives in relation to Lynetteholm to boost marine diversity and seabed habitats.