

3D COOLING WATER MODELLING

Cool water discharge at the Neminco II Asphalt Plant

Neminco intends to establish a second plant for the thermal treatment of asphalt. This plant will be located in the Port of Rotterdam, Botlek area. The thermal cleaning of asphalt creates a lot of heat. Part of the excess heat is removed by cooling water, which will be completely discharged on surface water. The effects of this discharge are modelled with TRIWAQ.

The system "WAQUA in SIMONA" is used for two- and three-dimensional hydrodynamic and water quality simulation of well-mixed estuaries, coastal seas and rivers. WAQUA in SIMONA contains the shallow water flow models WAQUA and TRIWAQ, which are intended to solve the shallow water equations in two (WAQUA) and three dimensions (TRIWAQ) in an accurate and fast way.

The water quality near the outfall is negatively affected by the discharge of cooling water on the surface water. With TRIWAQ it is possible to calculate the 3D effects of the cooling water discharge on the water temperature.

The cooling water discharge has been thoroughly implemented in TRIWAQ. At random locations a discharge can be defined. And in addition to the flow there are also the irradiation of sunlight and the heat exchange between water and air, included in the calculation of the water temperature.

The calculation of a cooling water discharge is applied in the port of Rotterdam. Several discharge points are included. The effect on the entire port is calculated in 3D. In the vicinity of the discharge points measurements were available. The good agreement between calculation and measurement gives confidence in the calculation.

CLIENT

Royal Haskoning

LOCATION

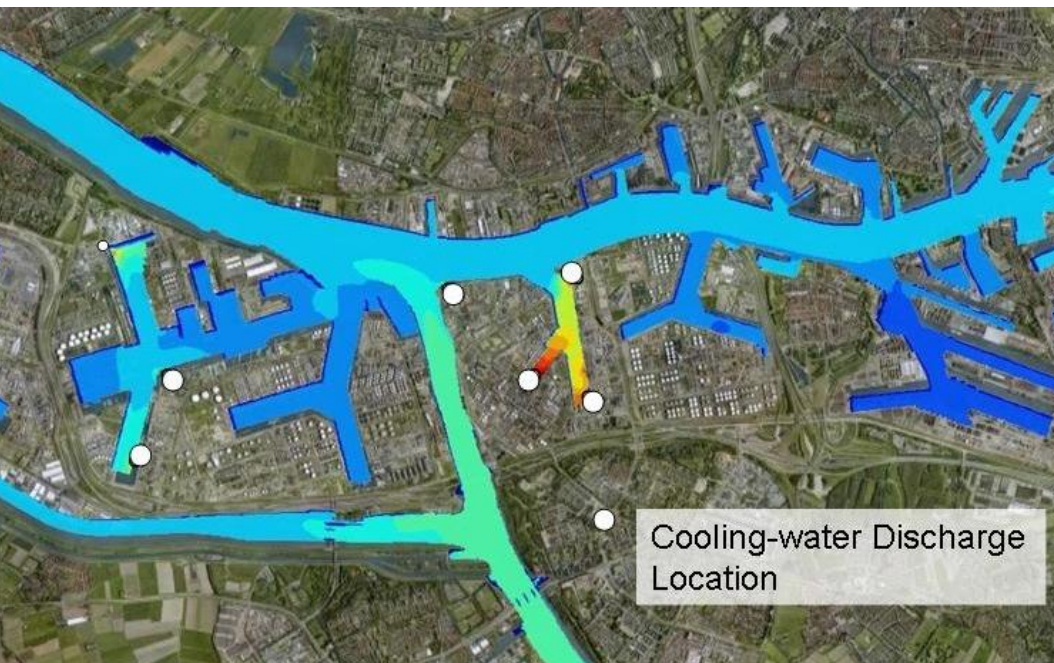
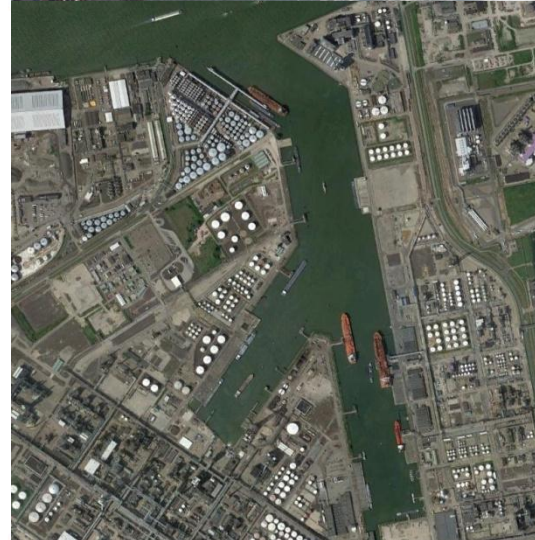
Port of Rotterdam, the Netherlands

DATE

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SERVICES

TRIWAQ cooling water modelling,
3D temperature modelling.



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