

Megasite Rotterdam harbour area



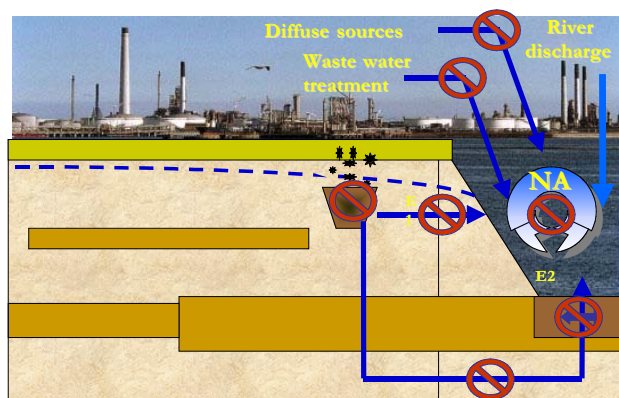
As part of the EU “WELCOME” project an Integrated Management System (IMS) is developed for the Rotterdam megasite. The IMS helps site managers to define the most (cost) effective set of mitigative measures, which satisfy the legislative, financial and social boundary conditions.

Risk-based approach

A risk-based approach at megasite scale is the basis for defining optimal management scenario's. At the Rotterdam megasite, a complete source-path-receptor evaluation is made to estimate the flux of contaminants and the risk to the receptors. The following receptors are considered:

- Surface water (E1).
- Deep groundwater (E2).
- Human exposure (E3).

Conceptual model for Port of Rotterdam



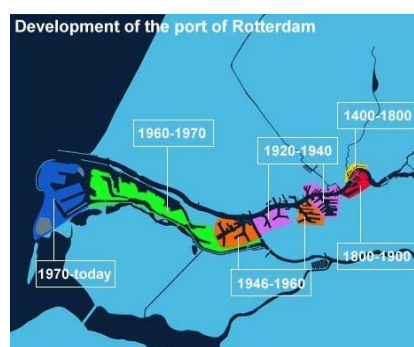
Megasite description

In addition to the conventional site description, a description at megasite level is made. This means that descriptive parameters are interpreted as **structure elements**. The following information is gathered, classified and spatially described in maps:

- Distribution of contaminants.
- Geohydrology.
- Natural attenuation potential.
- Situation of receptors.

Distribution of contaminants

Contaminant concentrations in soil and groundwater are collected from several databases (SOQUMAS, RoBIS, etc.) and classified on a 150 by 150 m grid to estimate the overall soil quality at megasite level. At the blank spots, where contaminant data are lacking, information of (former) activities at industrial sites can help to complete the picture.



Geohydrology

The following geohydrological information is obtained from the regional groundwater model of Rotterdam:

- Soil stratification.
- Groundwater units.
- Groundwater flow direction and velocity.

Natural attenuation potential

Based on expert knowledge of the subsurface conditions in Rotterdam, a rough redox classification has been made. This classification is further verified with geochemical data. Based on the redox classes, natural attenuation potentials are defined for distinct groups of contaminants.

Situation of receptors

For estimating the flux of contaminants towards the surface water, deep groundwater and human exposure related to functional use, the position and characteristics of these receptors are defined.



Risk assessment

In a fate and transport model the descriptive information is combined and used to make an estimation of the contaminant transport in the direction of one of the receptors. The risks are directly related to the contaminant flux. Each risk category is interpreted as a separate **risk-cluster** for which a distinct set of measures have to be defined.

Management scenario's

An integral assessment of the surface and groundwater quality will be made. This means the contribution from contaminated land and groundwater will be compared to the contribution from other sources such as: sewage, sediments and atmospheric deposition, to see where management options are most effective.