Environment Agency

Evidence

www.environment-agency.gov.uk

Parameter Values used in Coastal Dispersion Modelling for Radiological Assessments

Project summary SC060080/R3

A new report from the Environment Agency provides site-specific values for parameters used in coastal scenarios of radiological assessment models, including the Initial Radiological Assessment Methodology and PC-CREAM. Parameter values are provided for 80 locations around the coast of England and Wales which may receive discharges of radioactivity from nuclear sites and from the non-nuclear sector e.g. hospitals and universities, together with guidance on how to use these values within the Environment Agency's initial radiological assessment system. It will be of interest to nuclear and non-nuclear regulators, and to the operators of sites that are authorised to release radioactivity to the environment.

We use radiological assessment models to assess the impact of discharging radioactivity to the environment, via releases to air, river, coast/estuary or sewer. The models estimate the concentration of radioactivity in the environment, and from this the dose to humans and wildlife can be assessed. This enables us to meet our regulatory responsibility of ensuring that the dose received by members of the public from authorised releases of radioactivity does not exceed one millisievert per year.

The parameter values presented in this report allow us to improve our estimates of concentrations of radioactivity in coastal and estuarine compartments, and thereby improve our radiological assessments. Environmental concentrations depend on how much dispersion occurs within the compartment. For example, pollutants can build up in a small enclosed bay, but are less likely to do so in an area of open coast. Before this work was completed, we used generic and conservative assumptions for all sites, which will have overestimated the radiation doses in some cases. .

Volumetric exchange rate is the key parameter used to make assessments site-specific in the coastal scenario in the Initial Radiological Assessment. Volumetric exchange rate is the volume of water transferred from the local compartment during a tidal cycle.

Some of this water may be returned to the compartment during the next tidal cycle: to account for this, net exchange rates have been calculated.

This report provides site-specific values for the following parameters: volumetric exchange rate; net exchange rate; compartment volume; mean compartment depth; coastline length; diffusion rate; suspended sediment load; and sedimentation rate. These can be used in radiological assessment models such as our Initial Radiological Assessment Methodology and PC-CREAM.

This summary relates to information from project SC060080, reported in detail in the following output(s):

Report: SC060080/S3
Title: Parameter Values used in Coastal Dispersion Modelling for Radiological Assessments
January 2010
Report Product Code: SCHO0211BTKE-E-E

Internal Status: Released to all regions
External Status: Publicly available

Project manager: Laura Newsome, Evidence Directorate

Research Contractor: Centre for Environment Fisheries and Aquaculture Science, Lowestoft, Suffolk, NR33 0HT

This project was funded by the Environment Agency's Evidence Directorate, which provides scientific knowledge, tools and techniques to enable us to protect and manage the environment as effectively as possible.

Further copies of this summary are available from our publications catalogue: http://publications.environment-agency.gov.uk or our National Customer Contact Centre: T: 08708 506506
E: enquiries@environment-agency.gov.uk.