

Roche Position on Water – the basis of all life

Roche's Position

Roche supports international and national efforts to promote water protection, conserve water resources and improve access to clean drinking water in all countries. The entire Group is committed to further reduce discharge of toxic and poorly biodegradable substances and heavy metals. Wastewaters from manufacturing will continue to be discharged to receiving waters only if they fully comply with all relevant regulations, including pre-treatment requirements if necessary. Roche is proactively addressing water protection issues specific to our industry through participation in international and national bodies dedicated to studying the impact of trace chemicals, including pharmaceuticals, in surface waters and groundwater. Roche sees its efforts for a responsible management of water resources as an important element of its endeavors in the field of sustainability.

As an important manufacturer of pharmaceuticals, Roche is conscious of its responsibility and is therefore committed to obtain reliable data on our compounds and to use these data as a basis for integrated risk assessment and corresponding risk management measures to reduce emissions. On a national and international level, Roche is funding research projects that have similar objectives. The topic frequently referred to as “pharmaceuticals in the environment” is clearly an issue of significant interest to Roche (http://www.roche.com/pharmaceuticals_in_the_environment.pdf). Pharmaceutical residues are detected in surface waters and in some cases also in groundwater and drinking water at very low concentrations. This is due on the one hand to the poor biodegradability of certain drugs and the increasing quantities used. On the other hand, the ever growing sensitivity of modern analytics allows the detection of ever smaller amounts of substances in water bodies. While there appears to be general agreement that the risk to humans from exposure to small concentrations of individual compounds is low, there is still much to learn about possible long-term effects of mixtures of pharmaceuticals, especially on aquatic organisms.

As the world largest manufacturer of in-vitro diagnostics, Roche is intensifying its efforts to reduce discharge into waste water from the use of its diagnostic products and to reduce the presence of harmful substances in these liquid wastes. The challenge is to guarantee reliable results of the diagnostic method while having a minimal adverse effect on the environment. Presently, processes are being set up to deselect harmful substances when new diagnostic methods and instruments are first developed.

On a local level, special programs to conserve water reserves and reduce water consumption have been introduced at various Group companies. Many of these programs were originally identified through our regular Group-wide eco-competitions, where

prizes are awarded to employees based on the merit of their suggestions and the likelihood that their suggestions can be implemented at other sites within the Group.

The global situation

The basis of all life is water. Water covers much of the Earth's surface, although only about 3% of this is fresh water. The bulk is accounted for by the salt water in the oceans. Of the total amount of fresh water, however, only a small proportion is available as drinking water, the majority being locked in the polar ice caps and glaciers or existing as groundwater.

The Earth's drinking water reserves are thus limited and very unevenly distributed. As a result, many people are currently living in countries where clean water is scarce. Accesses to clean drinking water and the availability of water for food production are basic preconditions for development. In most industrialized countries the availability of an uninterrupted supply of water is taken for granted. Rivers, lakes and groundwater are continually replenished by regular precipitation. While the supply of this valuable resource has not typically been an issue, the quality of the water available is sometimes compromised by various pollutants, many of which are generated as a result of industrial or agricultural activities.

It has recently become apparent that parts of the world are facing a true water crisis. Because of an ever-expanding population, political conflicts, the continued widespread negligent use of water (in particular in agriculture), insufficient water re-use, and the effects of climate change, the impact of inadequate water supplies will be a significant issue in the years to come. Government awareness of this predicament continues to increase even in countries not directly affected, with mitigation measures being identified in an effort to reduce the global impact. In 2010, the United Nations General Assembly approved a resolution to make access to water a human right.

The situation at Roche

The availability of high-quality water is critical to Roche. The production of pharmaceuticals and diagnostic products is not possible without clean water in sufficient amounts. Figures on the consumption of water by individual Roche sites have been part of regular internal reporting since 1991. Total consumption has been published yearly since then.

Globally, the Roche Group needs approximately 20 million cubic meters of water each year to run its business; more than half of this volume is used for process-cooling purposes. Approximately 43% of this is supplied from municipal systems, while we provide the remaining 57% ourselves from river water intake systems and groundwater wells. Additionally, an investigation has recently been carried out into exposure to water

stress in our own operations and at key supplier's locations. At the overwhelming majority of sites, the supply situation does not cause concern. A few sites were identified as candidates for a more detailed analysis potentially including, among other things, an in-depth discussion with the water supplier.

The water taken from rivers and wells is used primarily for cooling in production processes, and therefore does not normally come into contact with chemicals.

Regarding water conservation, at some sites, the water used for cooling is recirculated in closed loops and cooled in cooling towers or via heat recovery units. After thorough analysis and assessment it is discharged back into rivers. Other sites in more arid regions have adapted their landscaping with drought-resistant plants to use less water.

All aqueous process wastes at Roche are treated in wastewater treatment plants. The vast majority of the organic material in Roche's wastewater is degradable and thus removed in the biological treatment steps of the waste water treatment.

If indicated, specific wastewater streams are pre-treated at the source prior to being discharged to the wastewater treatment plant. Excess activated sludge from the wastewater treatment plants is separated, dewatered and incinerated or landfilled in compliance with the local regulatory requirements.

Since the early 1970s, Roche has invested in the construction of modern wastewater treatment plants. Over the years, these investments have resulted in a significant reduction in the total organic carbon (TOC) load discharged into receiving waters from Roche sites throughout the Group. The TOC removal rates of Roche wastewater treatment plants average over 90% and clearly exceed national regulations (see more details at http://www.roche.com/fact_sheet_emissions_into_water.pdf). Heavy metal compounds in wastewater are not biodegradable and, depending on their concentration, are harmful to animals and plants in natural waters. They can accumulate in the food chain or be deposited in sediments. Roche Group emissions fluctuate around a very low level. Almost all of it consists of metals (zinc, copper, chromium) leached out of piping by wastewater and emitted in this way. Roche does not, however, discharge any toxicologically significant metals such as cadmium or mercury into wastewater.

In conclusion, Roche adheres to the following three principles concerning water use:

- Whatever is done should be as sustainable as reasonable possible.
- Emission of harmful substances into the aquatic compartment of the environment should be minimized. This concerns not only production at our sites, but also the use of our products as pharmaceuticals or diagnostics.
- The effect of our manufacturing on the thermal balance of the aquatic environment should be kept to a minimum.

More information

The topic of water has been regularly addressed in the annual Roche Group Reports on safety and environmental protection and in the subsequent sustainability reports (http://www.roche.com/investors/annual_reports.htm).

Roche's Guidelines for the Assurance of Safety, Health and Environmental Protection in the Roche Group, including the Annex "SHE Principles and Procedures":
http://rochenet.roche.com/cse-guidelines_assur_safety_env_protection.pdf

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