

4 Systems for environmental management and compliance with regulations

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Strategy

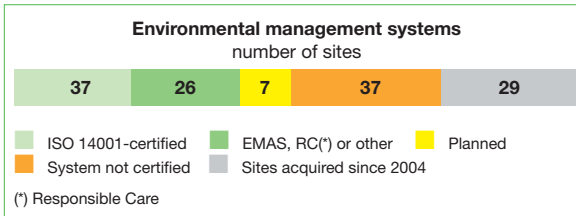
- Applying Solvay's Responsible Care® policy and the Guidelines specifying how that policy must be applied.
- At the sites where there is a significant risk of adverse environmental effects, establishing environmental management systems of ISO 14001-type (or equivalent) and getting them certified.
- Using these systems to characterize the risks and ensure they are controlled.
- Verifying and ensuring compliance with the regulations and operating licenses.

Our production plants for plastics, chemicals and pharmaceutical products, and those producing vehicle fuel systems (Inergy Automotive Systems), in view of their nature and the production volumes, present potential risks of adverse environmental effects. At such sites, environmental management systems (*) are used, generally of ISO 14000-type in Europe, with similar systems elsewhere. In the United States and Argentina, for example, the management systems generally stem from the national Responsible Care® program, while in Australia and the United Kingdom other systems, such as British Standard 7750, co-exist.

In 2007, these environmental management systems were in operation at 87 of the 97 relevant sites (43 chemical, 4 mixed chemical and plastics, 24 plastics, 24 Inergy and 2 pharmaceutical), and 63 had certification. Most sites involved in plastic processing that produce pipes and fittings (those of our joint Venture PipeLife) or in pharmaceutical production do not require such complex management systems.

These systems include verification of compliance with laws and performance documentation. In addition, they require regular Management reviews, and application of the continuous-improvement procedures "Decide, Plan, Implement and Verify" ■

(*) See Systems and Tools, page 88



The Map Ta Phut site (Thailand), producing PVC and hydrogen peroxide, certified ISO 14001

5 Management of contaminated soil and historic pollution

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Strategy

- Protecting underground water resources and surface water, and the health of local residents, through a program, at all relevant sites and following in-depth diagnosis, for control of risks due to historic contamination of the soil.
- Making such programs a permanent feature of the environmental management.

The Group has developed skills and internal know-how relating to management of historic soil contamination. To begin with, there is a hydro-geological diagnosis and characterization of the contamination, making it possible to assess risks to the ground water and, if necessary, work out plans for containment or remediation. These plans are discussed with the authorities.

After the soils and underground water resources had been characterized at 50 currently active sites, programs for continuous monitoring of the underground water were established.

This action has been taken over the past 15 years, with measures to confine soil contamination at 23 sites where active protection of the ground water was needed. In addition, Solvay teams also undertake monitoring at a other sites that have been sold, or where the Group no longer undertakes industrial production.

The solutions vary greatly. At Onsan (South Korea) for example, when the production of barium and strontium carbonates – used among other in cathodic television tubes – ceased in 2005, and in addition to partial recycling of the effluents to produce a road-construction material, 140,000 tonnes of semi-liquid wastes were transferred to an approved disposal site. Soil remediation and monitoring are expected to continue for a few more years.

At Martorell (Spain), where solvents had penetrated to the water table below the Group's site, a combination of measures has been applied, starting in the 1990s, to protect the groundwater resources that extend outside our site: hydraulic confinement of the water, biological remediation and air cleansing of the water extracted from underground. These measures are backed up by a network of 20 or so monitoring wells.

The plants at Bussi sul Tirino and at Spinetta Marengo (Italy), taken over from Montedison in 2002, have since then been subjected to a thorough investigation and environmental monitoring, beginning with a detailed characterization of the soil and underground water. This led to a hydro-geological model being drawn up and technical intervention being implemented in close collaboration with the relevant authorities, the aim being to confine and remediate the site's historic contamination.

As knowledge-sharing is a key factor for managing soil contamination, Solvay participates in the European NICOLE network, where the rapidly growing experience and knowledge in this area of risk management is shared. Data from monitoring the groundwater at Solvay sites are steadily being collected in a central Geographical Information System (GIS) database ■

Tavaux: management of a soil liability through close collaboration with the local authorities

Pollution of the water table under the plant at Tavaux (France) was identified and, in 1987, subjected to an order from the local authority. A hydro-geological containment has been installed, in order to prevent the pollution from migrating elsewhere. In 2004, an independent body carried out an in-depth analysis of the health risks which, despite the containment measures, revealed a need for the authorities to restrict certain uses of the groundwater resources. It should be noted that the area within which use of the groundwater was restricted had never been used to feed into the public supply of drinking-quality water.

In the area affected, the restriction relates to the use of individual wells as a source of drinking water. Over a more limited area, the restriction extends to bathing water (for private swimming pools). Other uses, such as watering gardens and crops, or watering livestock, do not present any particular risk, and are therefore not subject to any restrictions.

Cooperation with the local authorities (town councils, and health and environmental authorities) has been close, and characterized by transparency.

Targets for 2012

- Obtaining ISO, EMAS(*) or equivalent environmental certification for all relevant sites(**).
- Ensuring that all the sites operated by Solvay or Inergy have an integrated system to verify compliance with the regulations.

(*) EMAS : European voluntary Eco-Management and Audit Scheme

(**) Manufacturing sites for plastics and chemicals, and main pharmaceutical production sites, but excluding activities in plastic processing to produce pipes and fittings (PipeLife).



Units to treat contaminated underground water at Bussi sul Tirino (Italy)

The technical solutions for protecting underground and surface water resources vary considerably. Düsseldorf (Germany) provides a good example of a project that is soon to be completed. The site has been acquired in 1965 and has ceased activity in 1998. Soil remediation began there in 1996. The good results obtained and precise monitoring of what was happening in the subsoil made it possible to hand over the land with authorization for it to be built on.

Targets for 2012

- Completing the program to characterize soil and underground-water contamination, and to assess risks.
- Applying securing containment measures for underground water when justified by new results from risk assessments.
- Testing new remediation techniques, such as in situ heat treatment.