

# SOIL AND GROUNDWATER REMEDIATION

*GRI Standards: 306-3: Effluents and Waste*

## I. BACKGROUND

Soil and groundwater remediation at Sanofi addresses two issues:

- Sites currently operated by the company that may have an impact on soil and groundwater;
- Soil and groundwater contamination that may exist at certain sites as a result of past industrial activities.

Today's environmental and technical regulations provide a stringent set of requirements for preventing and controlling possible sources of soil and groundwater contamination, such as spills and releases to soil, water and air.

However, some sites may have been operating for many decades, during times when environmental standards were less stringent than they are today, and when knowledge about the environmental impact of industrial contamination was limited. Thus where past contamination exists, it may represent an environmental liability that the current site owner must manage.

## II. POLICY

Sanofi's policy addresses the prevention of spills and releases to avoid future soil and groundwater contamination, and remediation of historic soil and groundwater contamination.

In order to avoid future soil and groundwater contamination, each site maintains a procedure to assess, prevent and control the potential for spills and releases to air, water and soil. Each industrial and research facility complies with regulatory soil- and groundwater-contamination prevention principles and good practices, as outlined in both construction and environmental standards. This includes maintaining the integrity, containment and monitoring of above-ground and underground tanks, vaults, pipelines, loading and storage areas, and sewer systems containing materials that may be hazardous to the environment. In addition, spill-control kits are included as part of the emergency spill-response program wherever hazardous or potentially harmful liquids are stored or handled.

In terms of existing historic contamination of soil and groundwater, the objective is to take appropriate steps to ensure that the affected sites do not pose undue risk for the health of employees and visitors, neighboring communities and the environment.

All remedial work is carried out in accordance with the applicable current standards and regulations, and in co-operation with local authorities. However, as a general principle, Sanofi will proactively take early action to mitigate any potential risks resulting from historic contamination, and will take steps beyond those necessary for legal compliance where appropriate. Once the work is completed, the remediated property can generally be authorized for industrial or office use. Some remediation projects can be allocated for possible future residential use, in co-operation with the relevant standards and local authorities.

### III. ACTIONS

#### 1. Setting up a process for remediation of contaminated sites

Today, industrial engineering standards and technical monitoring methods make it possible to prevent and avoid most risks related to sub-soil and groundwater contamination.

Nevertheless, industrial practices used at certain sites in the past, when environmental standards were not as stringent as they are today, sometimes led to soil or even groundwater contamination when facilities were located near aquifers. Today's environmental laws and regulations require Sanofi to implement investigation and eventually remediation processes for contaminated sites.

These regulatory requirements concern sites where:

- Sanofi operates,
- Sanofi (or legal predecessors) operated in the past,
- Sanofi (or legal predecessors) may have disposed of waste.

For this reason, financial provisions are established and adjusted every year to take into account new events that may have occurred, as well as updates to environmental assessments.

#### 2. Assessing the risks and conducting soil remediation

Sanofi maintains a responsible approach to managing the sites where the company (or legal predecessors) operates or operated in the past.

The company systematically applies a multi-year soil and groundwater monitoring and evaluation program for Sanofi properties, both for those that are currently owned by the company, and those that were formerly owned and/or operated by Sanofi.

Sanofi relies on detailed risk evaluations of soil and groundwater contamination. These evaluations are carried out, when necessary, at the company's sites or former sites. Remediation projects are initiated either by local authorities or by Sanofi. Remediation is currently underway at over 20 Sanofi sites worldwide, as well as several other sites that have been sold to third parties, with guarantees from the company with respect to environmental liabilities.

In total, remediation costs amounted to €62 million in 2018 (compared to a total of €67 million in 2017).

*For more information, see [Form 20-F 2018](#), Environmental Risks of Our Industrial Activities section, p. 17.*

### IV. CASE STUDY: FORMER PEYNIER AGROCHEMICAL SITE (BOUCHES-DU-RHONE, FRANCE)

Historical view (1960)



During the works (2015)



After the works (2017)



Site characteristics:

- 10 Ha (5.5 Ha concerned by the former industrial activity);
- 30 Km North of Marseille, France;
- Industrial (microelectronics and logistics) and dispersed housing.

## 1. Past situation (prior to remediation works)

The former agrochemical site located on Peynier municipality, at thirty kilometers from Marseille, France, was operated from 1960 by PECHINEY PROGIL and RHÔNE POULENC AGRO for the formulation of fungicides, micronized insecticides and herbicides (powders and liquids) until its closure in July 1996. It is currently owned by AVENTIS AGRICULTURE, a subsidiary of SANOFI group. Preliminary remediation actions were performed in 2000.

These actions consisted in excavation, tarmac covering, and installation of a drainage system up-gradient to the site. A pumping system for the collection of the water of a drainage system implanted downgradient to the site was installed in 2006 and removal of a part of underground networks with removal of surrounding impacted soils was conducted in 2010. The main part of industrial buildings was dismantled in 2008.

Investigations identified residual contamination by pesticides and volatile organic compounds in soil and groundwater beneath the industrial site area. However, no major impact was detected at the adjacent parcels also owned by AVENTIS AGRICULTURE nor at the parcels located up-gradient and downgradient to the site.

## 2. The remediation project

A site management plan was established in compliance with the French methodology for the remediation of contaminated lands and sites in order to define the management measures in view of the cession and the industrial / commercial site redevelopment.

- Management program was validated by the Authorities (Permit: March 2014).
- Remediation works were performed between May 2014 and February 2016.
- Concrete slabs, tarmac, foundations, underground pits and networks of the southern part of the site were removed.
- Remaining buildings were dismantled.
- Residual soil sources of contamination were removed. The most impacted area was excavated under a tent with treatment of the collected exhaust air.
- All materials were sorted, stored, and concrete slabs and tarmac were crushed. The impacted fractions were treated off-site (mainly by thermal desorption). The fraction with contaminant concentrations below the remediation thresholds were reused to backfill the excavated areas.
- Waters from the site (run-off and groundwater at the bottom of the excavated areas) were collected, treated, and then discharged to La Foux river after analysis, in compliance with the permit.
- At the end of the excavation works, the surface coverage (bi-layer) on the whole site was restored and reshaped. These operations allow to intercept the exposure pathway to surface soils, to limit rain water infiltration and to ensure that there is no impact when discharging the effluents to La Foux river.

## 3. Current situation

- Achievement of the remediation results was validated by the Authorities in May 2016.
- Absence of human health risk for industrial redevelopment was confirmed by a Residual Risk Assessment.
- The permits covering deed restriction and post-remediation monitoring were obtained in June 2017.
- The site is now ready for sale for industrial or tertiary use.