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Toxic metals from cement kilns: from the scientific literature to Merone's soils

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Summary

As is well known and widely reported in the literature, cement kilns are an important source of several metals which are potentially dangerous for human health and the environment, e.g.: Arsenic, Cadmium, Chrome, Lead, Thallium, Vanadium and Mercury.

Relatively recent studies on land contamination around cement kilns have shown higher concentrations of several of these metals in soils, in foods and in residents' blood samples. This contamination is attributed to the emissions of the cement kilns in the relevant areas.



Taking of samples in Merone.

In these studies the metals responsible for the contamination were highly variable, and could well be the result of the relatively recent practice in cement kilns of using fuels and raw materials derived from various kinds of industrial waste.

Measurements carried out in 1992 showed that the emissions of the cement plant Holcim Italia SpA of Merone contained the following metals: Lead, Chrome, Copper, Mercury and Arsenic. These metals were present in the fuels being used (fossil carbon, petroleum coke, pitch waste, spent bleaching clays). Their concentrations in emissions varied significantly, depending on the fuel used. Mercury was especially high in these 1992 readings: 4 and 12 grams per hour.

In 2005 and 2006 IST carried out analyses of metals collected from the superficial layer of soil in wood covered areas from 14 different sites around Merone's Holcim cement plant.

Concentrations of Cadmium, Thallium, Lead and Mercury in the samples collected were higher than values considered acceptable for public green areas in 3 areas (via Cesare Battisti, Alzate Brianza, Nobile).

These data suggest that regular smokestack measurements of these metals are necessary, as well as a network of deposimeters for metal accumulation measurement in the most vulnerable areas downwind of the Holcim cement plant.

The concentration of toxic bioaccumulable metals, especially Cadmium and Mercury, should be measured periodically in foods (crops, dairy products, fish and fish products) coming from these areas, and concentrations should be monitored in relation to maximum concentrations allowed by the present Italian and European legislation.