



INDUSTRIAL POLLUTANTS IN GROUND WATERS FROM NORTHERN MILAN

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Abstract

Ground water samples from an industrialised area near Milan were analysed by gas chromatography-mass spectrometry (GC-MS) to identify the main pollutants and to quantify two classes of chemicals: polychloro-1,3-butadienes (PCBD) and some aromatic amines. The water contained several halogenated aromatic and aliphatic compounds and heavy contamination due to PCBD, probably arising from contaminated land where a disused chemical plant is located. All the samples contained low levels of aromatic amines indicating a diffuse contamination probably arising from different sources. ©1998 Elsevier Science Ltd

Introduction

The north-west area of Milan is one of the most populated and industrialised regions in Italy and ground water contamination has been already described [1]. This area houses an important dye manufacturing plant, disused since the '70. Chemical wastes, many of them not yet identified, have been widely dispersed into the soil or stored in basins and tanks, some of them without any waterproofing.

Qualitative and quantitative analysis were done to investigate the type and the degree of contamination in ground water samples from Limbiate, Senago and Bollate, three municipalities lying south of this ex-industrial area (Figure 1). On the grounds of qualitative analysis and of chemical production in the area, levels of polychloro-1,3-butadienes (PCBD) and aromatic amines were investigated.

Very little can be found on PCBD in the literature. They are of industrial origin since they are by-products of the production of chlorinated solvents or intermediates of rubber compounds manufacture [1, 2], and they can persist in the environment [3]. Hexachloro-1,3-butadiene (HCBD), the most widely studied, is included in the EPA list of priority pollutants. It was used as a pesticide in the former Soviet Union [4] and 1,1,3,4-tetrachloro-1,3-butadiene has been detected in the environment in Eastern Europe [5].

Aromatic amines such as aniline and its substituted derivatives are much better known. Like PCBD, they may be released into the environment from industrial sources since they are residues and intermediates of several chemical manufacturing processes such as dyestuffs, cosmetics, medicines, rubber compounds, *etc.* [6-9]. They are generally dangerous on account of their toxicity and carcinogenicity [8-9] and they can be converted to dangerous N-nitroso compounds in the environment [5].

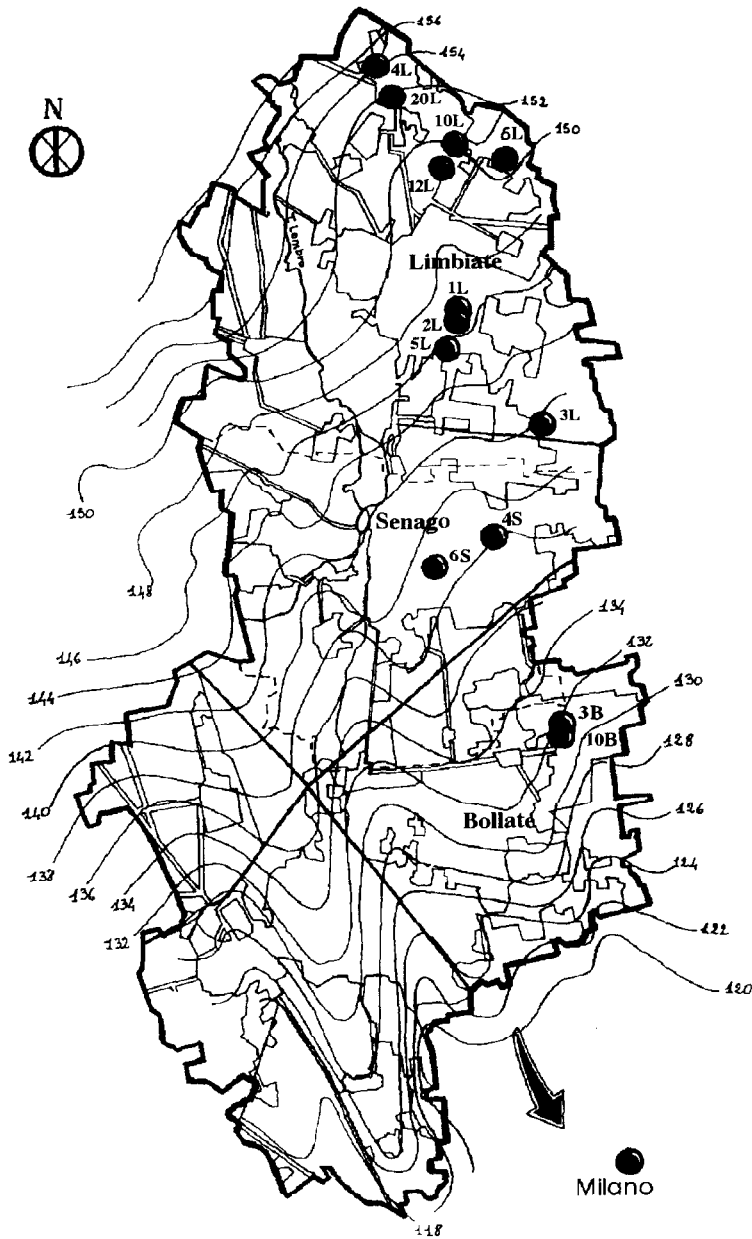


Figure 1. Map of the area showing the wells sampled and the ground water levels.

Experimental part

Sampling

Ground water samples were collected at Limbiate, Senago and Bollate (Figure 1) before and after active carbon purifying treatment during four different sampling campaigns (Nov 95, Jan 96, Oct 96 and Nov 96).

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