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Environmental Report 2004

Hoboken

content

Dear neighbour,

We are delighted to be sending you our annual environmental report - for the sixth time already. In this report, we wish once again to sketch out for you our company´s environmental performances and explain the most important achievements of the past year.

Important facts for the year 2004 include:

- reduction in the emissions of arsenic and cadmium
- decrease of the metals and dioxins in dust fall-out
- commissioning of stormwater pumps
- performance of the preparatory works for the soil cleanup in the Moretusburg and Hertogvelden districts

In this report we also tell a bit more about the expenditures which have been made over the years in the environmental area, and we take a detailed look at the construction of the noise barrier.

Once again you will have an opportunity to pose questions about this annual environmental report on the occasion of an information evening which will be held on June 16th at 7.30 p.m. in the Gildenhuis hall, Kapelstraat 296, Hoboken.

Naturally, you can always contact us with questions, comments and reactions at the toll-free number 0800/93 739, or by letter sent to the address A. Greinerstraat 14, 2660 Hoboken, Belgium, or via e-mail to the environmental coordinator: jan.kegels@umicore.com.

For specific questions about the soil cleanup in the Moretusburg/Hertogvelden districts, you can call the toll-free number 0800/94 028 or go to the website www.schoonmoretusburghertogvelden.be.

Hugo Morel
Executive Vice President

Air: emissions

Investment to reduce sulphur dioxide emissions approved and scheduled for 2005

By "emissions" we mean those quantities (of dust or gas) which are put into the atmosphere in one or another way. "Guided emissions" are dust and gases which are released via a stack; all other emissions are "diffuse emissions", such as dust or gas from buildings, dust which is blown about when loading, storing or transporting raw materials.

Guided emissions

Umicore Hoboken´s guided emissions are closely monitored, as provided for in the Vlarem 2 environmental legislation. Abnormal atmospheric emissions are prevented by strict monitoring, which includes the following:

- the regular measurement of parameters such as dust, metals, sulphur dioxide, nitrogen oxide, dioxins, etc.
- the continuous indicative measurement of the dust content in the residual gases after purification on a number of major stacks

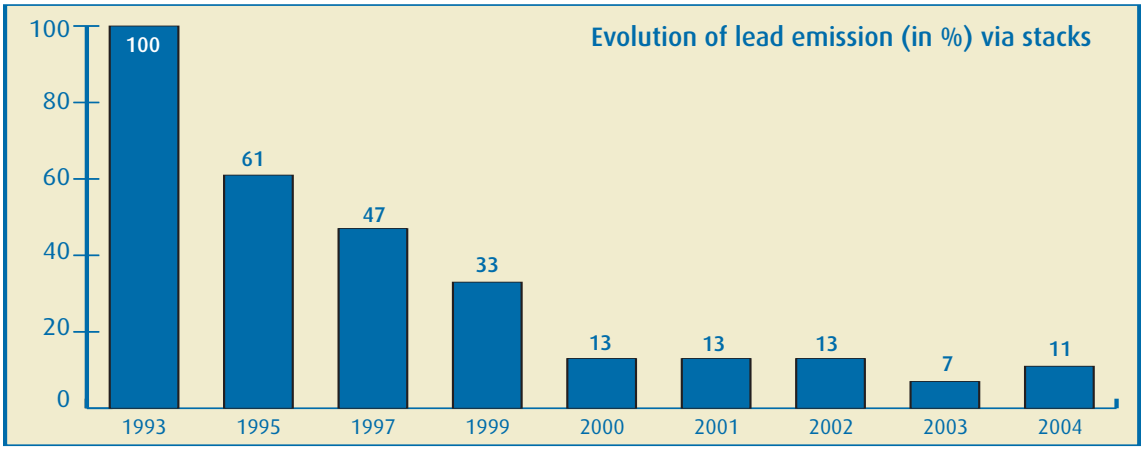
▼| Member of the environmental control team performing a measurement

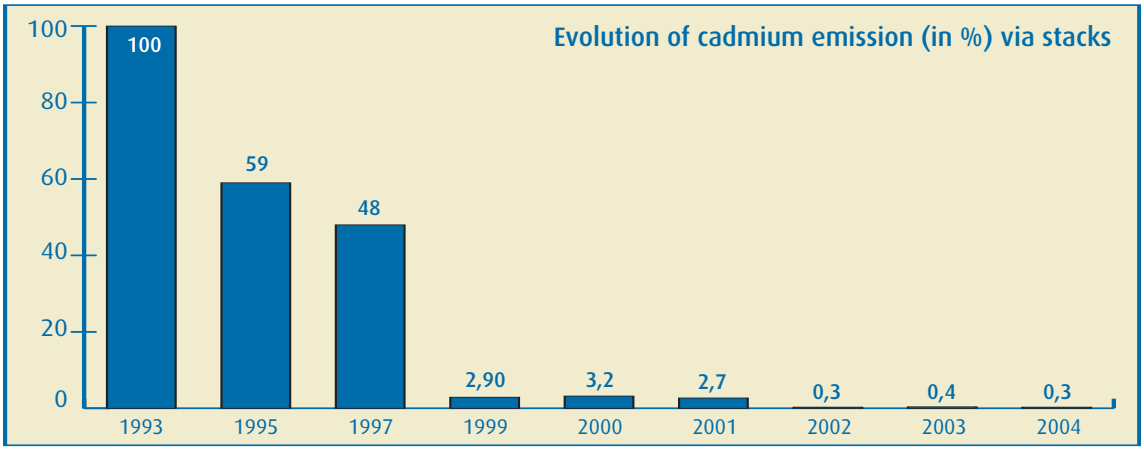
Metals

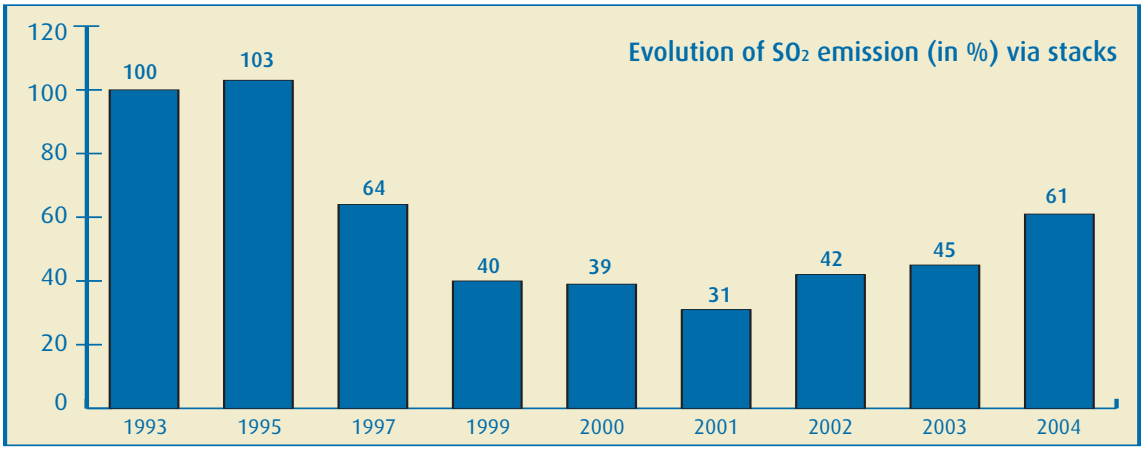
After several years of falling emissions, in 2004 an increase in guided emissions was found for lead and selenium. Nevertheless, the measured values still remain lower than those of 2002. This increase is entirely accounted for by a single emission point, i.e. the stack of the precious metals concentration department which is responsible for around 90% of the total lead and selenium emissions of the entire plant. A project is ongoing to fully modernise this process, and this will also substantially lower emissions. A decrease was found for copper and zinc, while the values of arsenic, nickel and cadmium remained virtually identical.

SO_2

Sulphur dioxide (SO_2) is generated during processing in the smelter, where the sulphur present in the raw materials is converted into SO_2. In the sulphuric acid department most of this SO_2 is then converted into sulphuric acid. SO_2 is also generated during the combustion of sulphurcontaining fuel. In 2004, a further increase was found for sulphur dioxide (SO_2). This is primarily explained by the increased processing of sulphur containing raw materials in the smelter. An investment planned for 2005 in the sulphuric acid department is in part designed to lower the SO_2 emissions. Given the fact that all guided emissions take place at a greater height, they have only a low impact on the near surroundings.







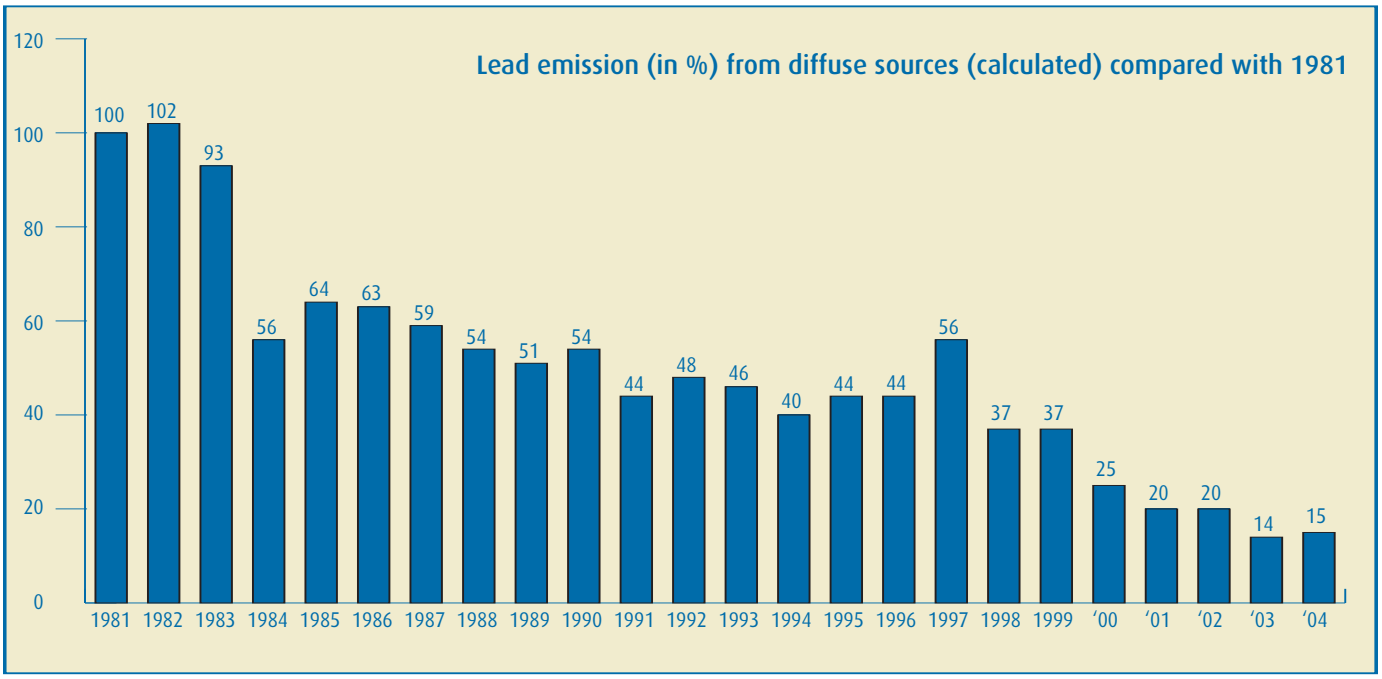
1| The graphs illustrate the evolution of the total stack emissions compared to 1993

Diffuse emissions

Diffuse emissions can occur during the transport and unloading of raw materials and intermediate products. They are estimated from the immission results. The evolution for lead is shown in the following chart.

After a favourable 2003, during which sharp reductions were achieved for virtually all metals, in 2004 we note a slight increase for lead and arsenic. For cadmium, a further decrease was found. The reasons for this are unclear, given that all of the measures taken to limit diffuse emissions, such as the sprinkling of roadways and storage grounds, have been maintained. Furthermore, in 2004 the wind was blowing in the direction of Moretusburg more of the time: 35% compared to 31% in 2003.

A study is currently being conducted which is intended to identify the most important sources of diffuse emissions.



▼ Dust spreading is prevented by regular sprinkling of the internal road ways.

Air: immissions

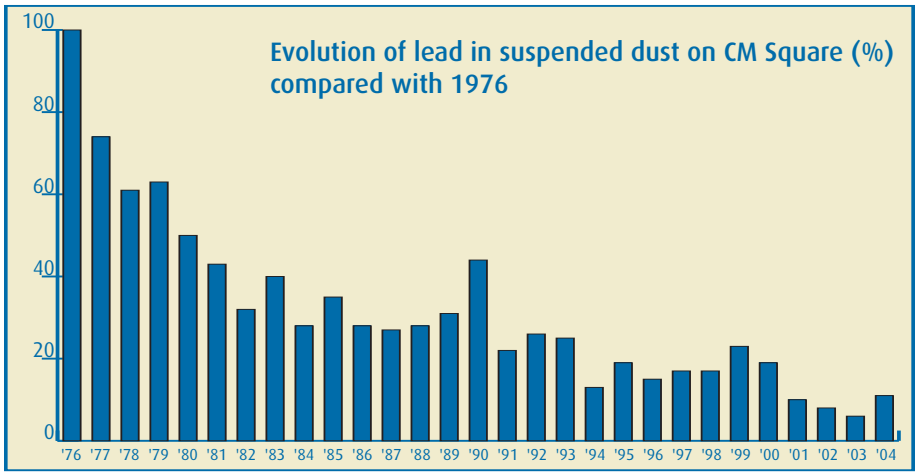
Decrease in dioxin fall-out in 2004

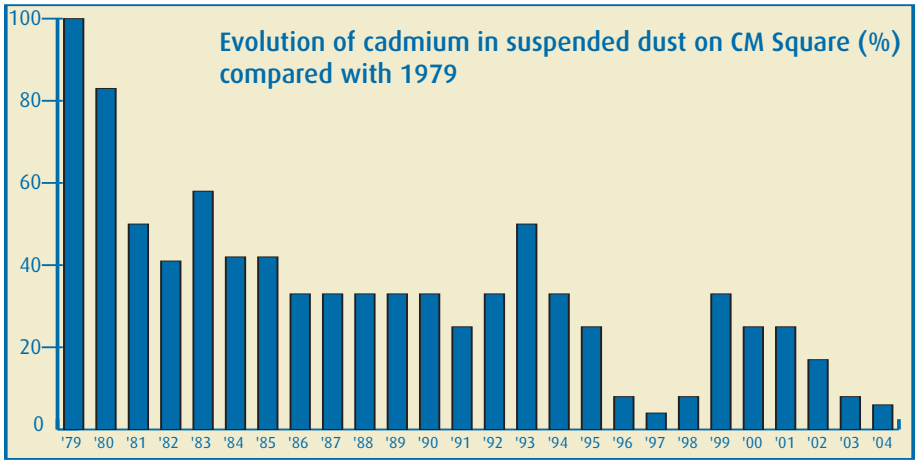
By **immission** we understand those quantities of dust which are present in the environment, such as **dust which is suspended** in the air as well as coarser, settling dust particles that **fall** to the ground. The immissions of Umicore Hoboken are also intensively measured, both by the authorities (the Flemish Environmental Agency, VMM) and by the company itself, both on and outside the plant grounds.

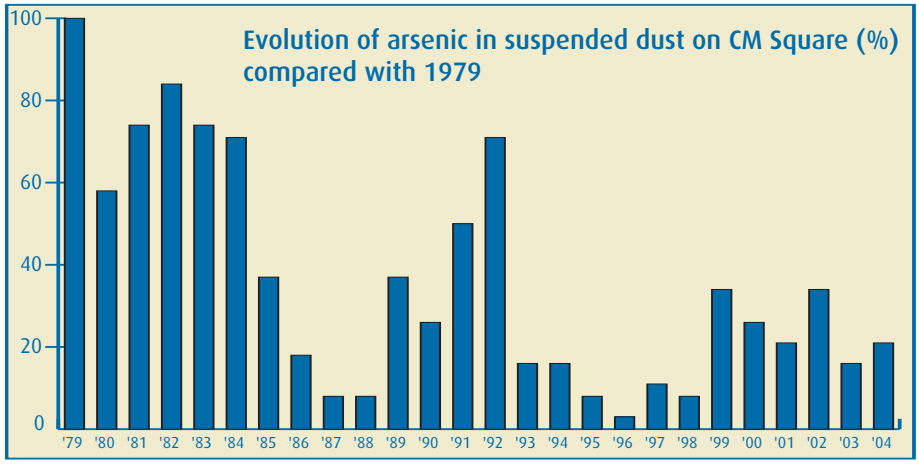
Suspended dust

The adjacent figures illustrate the evolution in percent of the elements lead, cadmium and arsenic on Constantin Meunier Square. For lead and arsenic, an increase was registered over the 2003 values, while for cadmium the measured values continued to fall.

On CM Square we went up to 0.34 µg lead/m^3 as annual average, but this still remains far below the new standard of 0.5 µg/m^3; this is also the case for arsenic (annual average = 0.08 µg/m^3; no standard).







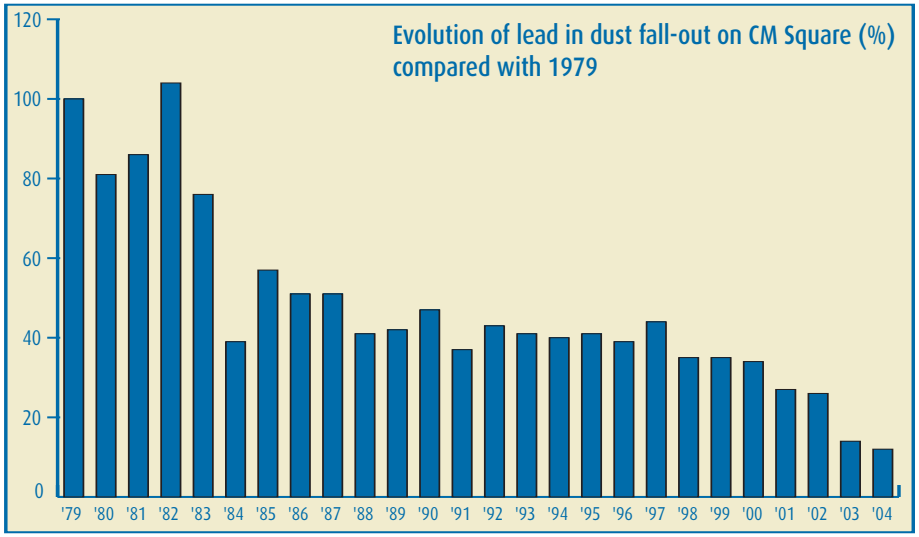
For cadmium, the measured concentrations fell further to 0.006 µg/m^3 (standard = 0.04 µg/m^3)

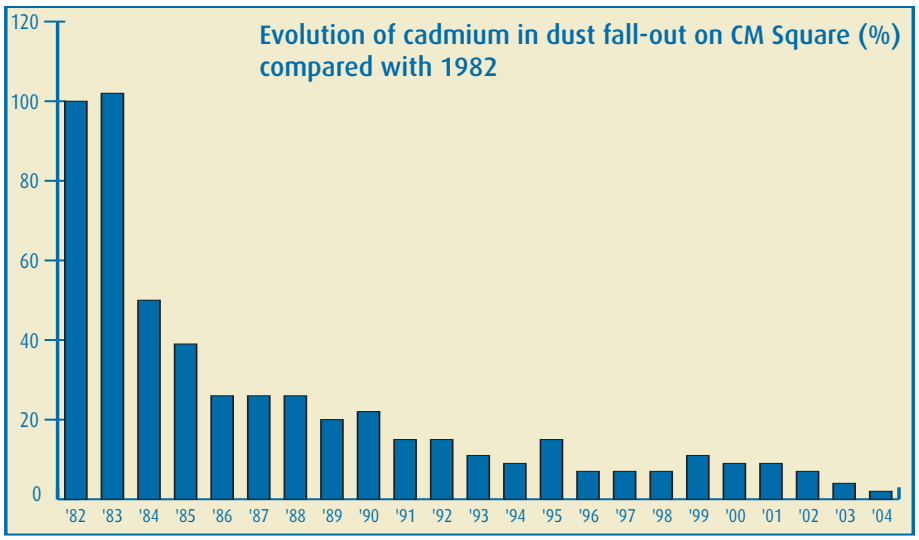
The average concentrations in PM-10 dust, i.e. dust with a particle diameter smaller than 10 µm (= one-hundredth of a mm), on CM Square amounted to 0.18 µg/m^3 for lead, 0.004 µg/m^3 for cadmium and 0.03 µg/m^3 for arsenic.

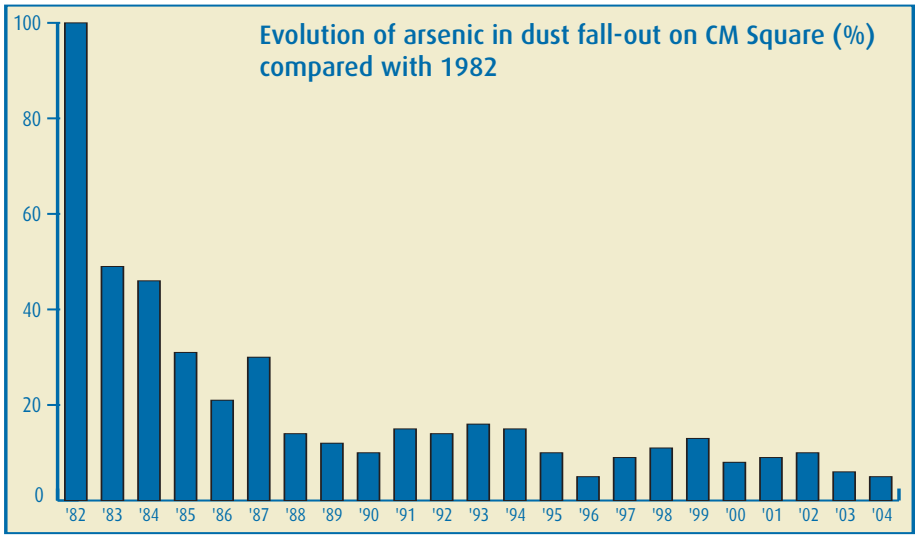
Dust fall-out

On CM Square in 2003 we found a lower level for lead, cadmium and arsenic in dust fall-out, as also appears from the adjacent graphs:

- Lead : 1,16 mg/m^2.dag
- Cadmium : 0,01 mg/m^2.dag
- Arsenic : 0,09 mg/m^2.dag







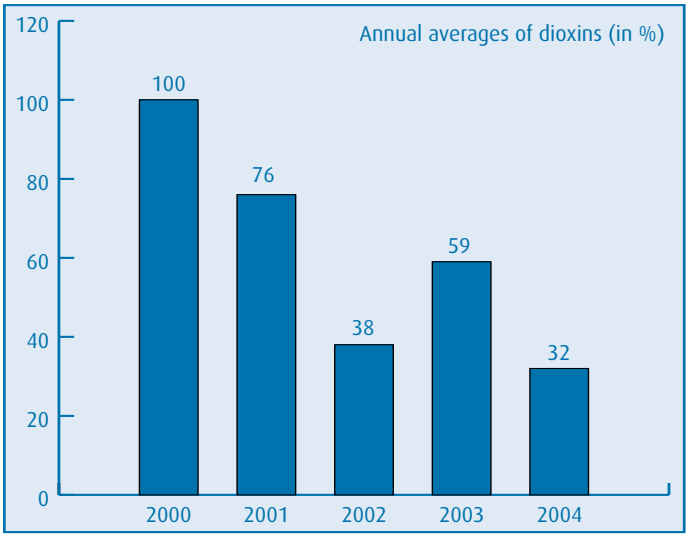
Dioxins

The Flemish Environmental Agency (VMM) characterises figures higher than 26 pg TEQ/m^3.d as "elevated", between 6 and 26 as "moderately elevated" and lower than 6 as "not elevated". As appears from the adjacent measured values, a significant reduction was achieved in 2004 compared to 2003. This decrease is attributable to measures taken which were derived from intensive research on possible dioxin sources, in particular:

- dismantling of old installations, thereby removing a 'historical' dioxin source
- identification of processes which could create dioxins + use of alternative processes

The annual average is evolving as follows:

	pg TEQ/m^2.day	%
2000	37	100
2001	28	76
2002	14	38
2003	22	59
2004	12	32



▼| Set of sampling gauges for monitoring dioxin fall-out

pg = picogram = 0,000000000001 gram

TEQ = Toxicity equivalent = a way to express the 17 most toxic dioxins and dibenzofurans as a single digit

Water

New storm pumps prevent untreated sewage water from being discharged directly into the Scheldt River at intense rainfall

▲ | View of the storm pumps which during intense rainfall can divert peak flows up to 7,000,000 l/h to the water treatment plant.

The production processes generate waste waters which are often highly acidic and contain elevated concentrations of metals. In order be able to discharge these waters, one must satisfy the discharge standards imposed by the government in the environmental permit.

Since 1980, a water treatment installation has been in operation on the Hoboken site which purifies all plant waste water. All rain water is also fed via an internal plant sewage system to the water treatment plant and purified. A significant quantity of these treated waters is reused internally in the plant, and the rest is discharged into the Scheldt River.
The table shows the evolution of the concentrations in mg/l in the drain water, demonstrating that all applicable standards are being met.

In 2004 ´storm pumps´ were also installed which ensure that, in the event of a storm or at intense rainfall, the peak flows can be transported and stored in two large buffer tanks with a total capacity of around 30,000 m3. In this way, no untreated sewage water is discharged directly into the Scheldt in the event of a violent downpour.

Concentrations in mg/l	standard	2001	2002	2003	2004
lead	1	0.03	0.02	0.05	0.04
cadmium	0.2	0.002	0.013	0.027	0.014
arsenic	1	0.10	0.18	0.15	0.18
copper	3	0.03	0.01	0.10	0.22
selenium	5	1.9	1.7	1.7	2.8
nitrogen	125	48	53	39	46

Noise barrier

The noise barrier between the Nachtegalenhof district and the plant will have a total height of 25 meters

Although the Nachtegalenhof district is not directly adjacent to the plant, some residents have nevertheless complaints about noise. This primarily concerns the hydraulic hammers which are used to roughly break up the lead slags, and the acoustic signals of vehicles operating on the plant grounds.

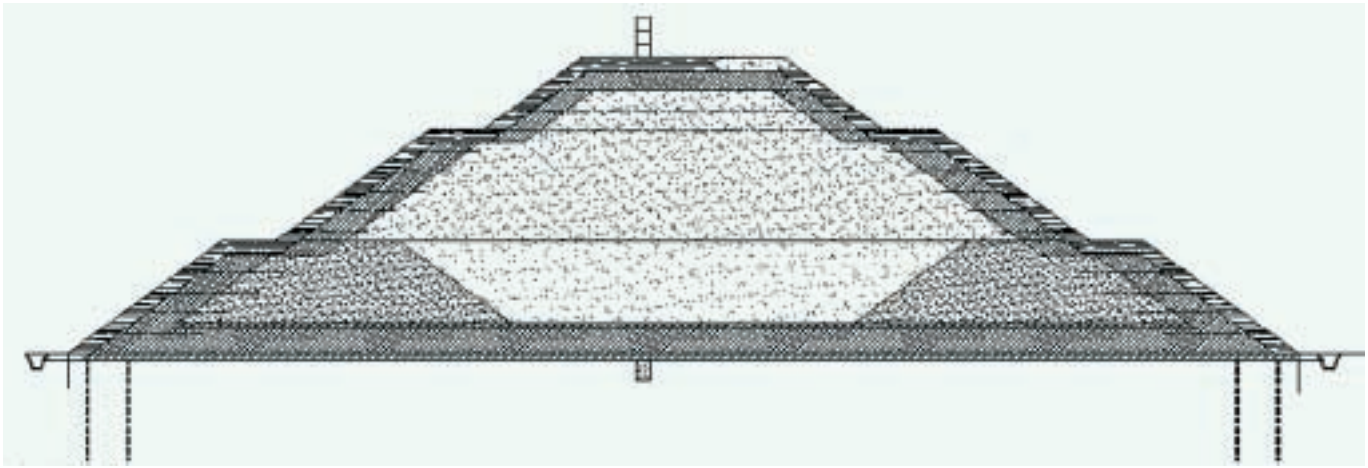
Since these noise sources are difficult to control and no real alternatives can be introduced, it was decided to build a noise barrier which offers the district maximum protection from the plant.

This noise barrier will be situated entirely on the Umicore grounds. A study demonstrated that it had to be 25m high in order to have enough of an effect in the district. In practice the barrier will be 22m high, and on top of it a small wall will be built with stone-filled baskets. This produces a sharper "crest", offering a better noise-reduction effect.

The barrier is being built of depleted slags and slightly contaminated soils which have been removed from the various soil cleanup works. During the works, the rain water which falls on the barrier is retained in a space confined within a liner and drained off to the plant's water treatment installation.

As a final step, the barrier will be covered with an impermeable liner. On top of that comes a layer of soil and a green covering with plants which can survive drier periods.

▼| Schematic view of the noise barrier



Soil cleanup

After years of research and consultation with the government, a number of soil cleanup projects will now be implemented in the coming years.

Information meetings (October 2004) were organised to explain the cleanup projects to the people of the districts of Moretusburg and Hertogvelden

Soil and groundwater cleanup on the plant grounds

In the past, a large share of the unused plant grounds have already been excavated over a depth of 30 cm and refilled with an equally thick layer of broken brick debris to prevent contaminated soil from drying out and being blown around. Other areas were completely covered over with concrete. In the future these techniques will also be applied on the remaining unused grounds, a total of around 6 hectares.

A drainage parallel to the Scheldt will receive the polluted groundwater and transport it to the internal water treatment installation, after which it will be reused in the plant for sprinkling and cooling (among other purposes). In principle, the studies will be submitted to the OVAM for approval during the summer, after which it will be possible to organise a call for tenders on the works themselves.

Moretusburg

In October 2004, the inhabitants of Moretusburg were invited to an information meeting where the proposed procedures and works were explained. In the Covenant which was concluded between the Flemish government, the OVAM and Umicore, it was agreed that any further spreading of contaminated soil must be prevented by excavating 30 cm of soil, refilling with the same amount of clean soil and replanting of the lots.

After the information meeting, the recognised soil clean-up experts began mapping out all of the lots in Moretusburg. Photos were taken and all elements (garden walls, trees, playthings, garden houses, etc.) were noted down on detailed maps.
Dust-filled areas which are rarely used were also inventoried. With this information, one is now working to define the best approach to the cleanup. All of this is being assembled in a report which will be submitted to OVAM for approval. Then the residents will be further informed about the decisions and they will be consulted about how to deal with their particular lot. The actual works would begin in the spring of 2006 at the earliest.

The public grounds of the city of Antwerp will also undergo the same procedure.

Hertogvelden

In the part of the district of Hertogvelden between the Kapelstraat and the L. de Landrelaan, many grounds have been excavated in the past and replaced by fresh soil at the occasion of the new construction works.

The OVAM therefore agreed to take new samples and prepare a supplementary descriptive soil study. The submission and the declaration of conformity is foreseen during the summer of 2005. The result of this study will indicate whether or not further clean-up measures are necessary here.

▼ Overview map of the inventory of the public domain of the Moretusburg district, as prepared by the soil clean-up experts

Environmental expenditures

Environmental expenditures amounting to around 6 million euros in 2004.

Since 1990, more than 100 million euros have been devoted to investment projects which are designed to improve the environment. This means that in recent years an average of more than 7 million euros per year was invested in environmental measures and projects. This investment programme will be continued in the future as well.

In 2004, a total amount of around 3 million euros were devoted to environmental projects. Of this amount, 560,000 euros went to projects for waste water treatment, 1,700,000 euros to emission limiting/controlling measures, 290,000 euros to soil cleanup/management and 260,000 euros to energy saving projects.

The most important projects were:

- renovation of the gas treatment installation of the precious metals refining department
- adaptations to the roadway sprinkling + installation of central control
- measures to limit the dust emissions from the lead refinery
- installation of storm pumps to prevent discharges of untreated water intense rainfall

In addition to the investment costs, in 2004 an amount of around 2.8 million euros was spent for renting sprinkling and sweeping vehicles, the maintainance of various installations for environmental protection and conducting the necessary studies and tests in order to meet the applicable environmental laws.

Supplementary to the already incurred environmental investments, a number of projects are currently being implemented, planned or studied:

- measurement and management of diffuse emissions
- projects on the further cleanup of soil and groundwater on the plant grounds
- the Moretusburg/Hertogvelden cleanup project
- expansion of the sulphuric acid installation to limit the SO_2 emissions
- construction of a noise barrier
- limiting the emissions from the precious metals concentration department

◀ | View of the former storage ground after the cleanup works (1999-2000 period)

View of the ventilation grates in the facade of the lead refinery. The investment led to a significant reduction in the emissions from the building | ▲

◀ | The total operating cost for cleaning and for sprinkling of roads and squares, stored raw materials amounted to around 1,500,000 euros in 2004.

Front: View of the Moretusburg district and Umicore Precious Metals Refining – Hoboken, Belgium

Complaints, questions, comments, ... ?

**Don´t hesitate to call us at the toll-free number 00 32 800/93739.
Your calls will be taken 24 hours a day. We promise to provide an answer as quickly as possible.**

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