

# The environment in the Rotterdam region 2004

This appendix contains the English translation of the summary and the introductory paragraphs of the chapters of the report called "HET MILIEU IN DE REGIO ROTTERDAM 2004". We have also included a translation of the graph titles and the unique indicator numbers, referring to the page numbers in the main report. The report is a result of a co-operation of regional environmental authorities. This co-operation is called "Milieumonitoring Stadsregio Rotterdam (MSR)".

Together with this appendix and the graphs in the report itself, we hope to give a good insight into the environmental quality in the Rotterdam area and of the efforts that are being made to improve this quality.



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## Foreword

The anniversary of ten years of environmental monitoring in the Rijnmond area is a cause for celebration and provides a good opportunity to give our familiar report a new look.

Looking back over the past decade it may be concluded that a lot has been achieved. For important parameters such as sulphur dioxide and dioxin, good results have been obtained. The contribution to this progress by major industrial companies can be clearly seen. Developments which underpin the celebratory mood. Unfortunately, however, there are also less positive developments which cast a damper on the festive atmosphere. The number of kilometres driven has done nothing but increase over the last ten years. The targets for water quality have not yet been met and concentrations of fine particulates form a cause for concern at various points in the region.

Monitoring as an instrument is highly important in order to gain an insight into the development of environmental pressure in the region. The status of the region as mainport reinforces this. It's simply a fact that the mainport function exerts a greater environmental pressure here than elsewhere in the country. Reliable data on environmental quality forms the basis from which to take prudent decisions for the future. As a result of the multiplicity of public organisations involved, a fragmentation of knowledge is almost inevitable. An integral approach to the various environmental issues and the corresponding problems forms the basis for effective decision making, aimed at improving the environmental quality in the region.

Looking ahead, the region with its mainport function is faced with a difficult task. The expansion of the port and industrial complex, a large number of housing activities, the transformation of the city docks and the increasing mobility flowing on from these developments exert great pressure on the improvement of environmental quality in the future. In this sense, all the obvious moves have already been made and from now on innovation and creativity will be necessary in order to take further steps in this direction.

In the seventies, the region came up with its pioneering air monitoring network. Looking to the future, it is clearly important to retain this pioneering position but new investments in terms of money, creativity and cooperation will be needed to achieve this. The combination of the largest port in the world, living and recreation forms a complicated mechanism that has to be kept in motion. This requires vision and courage on the part of organisations and politicians to enable them to look ahead together. Cooperation and vision are the oil that keep that mechanism in motion.

M.A. Bakker

Chairman of the Rotterdam Regional Council of Governments Environmental Monitoring steering group

Schiedam, June 2004



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## Introduction

Cooperation in the Rijnmond region is urgently needed. To start with, various local authorities and organisations are active in this area and these each have their own competences and responsibilities. Furthermore, the 'environmental field' is continually developing. Concepts such as sustainability and the region-specific approach now have an established place in environmental policy. The method is changing, however: the emphasis within environmental policy is shifting from a sectoral to an integral approach, from centralised to decentralised steering. This requires cooperation on various fronts: between the various local governments, but also between citizens, companies and local government.

Due to these changes and the diversity of their tasks, the local governments in Rijnmond handle a whole range of policy goals and norms. Unfortunately, the policy goals have not all been quantified yet and an environmental policy plan for the whole Rijnmond region does not yet exist. A positive point is that cooperation within the region is working well although local authorities are still reporting their findings, efforts and results in the environmental field separately. Furthermore, these reports generally still cover different areas. This means that information often tends to be fragmented and not easily comparable.

### **MSR and target monitoring**

For this reason it is important to have a total regional picture of the developments so as to provide an insight into the effects of policy, to get effective policy off the ground and to give an impulse to the (re)formulation of policy. In order to achieve this, in 1994 the cooperative body for environmental monitoring in the Rotterdam regional council of governments (MSR) was set up. Virtually all (former) government organisations which are concerned with the environment participate in this cooperation initiative: various agencies from the municipality of Rotterdam, Rotterdam regional council of governments (partly on behalf of the eighteen regional municipalities), DCMR Environmental Agency, the Province of South Holland, the high council of landholders of Schieland and Delfland, the Hollandse Eilanden en Waarden water treatment board, the Department of Public Works and Water Management, the South Holland Directorate, the Rotterdam-Rijnmond Police Force, ENECO Energy and the Rotterdam Port Authority NV.

This year MSR celebrates its 10th anniversary. To mark the occasion a special anniversary edition accompanies the annual MSR environmental monitoring rapport. This special edition takes an in-depth look at the environment in Rijnmond over the past decade and the expectations for the future.

What do we as MSR do? Since 1995 we have been compiling an annual overview using indicators and taking policy goals and norms as point of departure. As far as possible, the indicators incorporate the most recent policy goals. Within the environmental sphere of action this is also termed environmental policy monitoring; comparing the figures from a situation which has been found with the formulated policy goals and norms. In this tenth report this is referred to simply as 'monitoring'. In this way, administrators and their civil servants, target groups (such as industry, and agriculture and market gardening), public interest organisations (such as the South Holland Environmental Federation) and residents receive information on an annual basis regarding the state of the environment in the Rijnmond region.

How do we achieve goals and indicators? In appendix 3 of this report you will find an overview of the most important policy documents from which the goals are derived. Where no verifiable policy objectives are available, indicators perform a warning function. In principle, an indicator is made up of a description in figures of the status and/or the development of environmental aspects and their accompanying policy goals or norms. Most indicators show a picture of the past ten years.

Via an organisation of working groups, indicators are selected each year which show the status or development of numerous environmental aspects. Moreover, we have condensed the greater part of the data by applying aggregation. In some cases we were able to further aggregate the indicators into indexes; these reflect the situation for a theme in its entirety.

The origin of all data is traceable through systematic registration. Each indicator has a unique number. That number refers to the background documentation on data source, contact person, foundation in figures and relevant policy reports. Reports are made annually based on this monitoring system.

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We have opted for trend analyses because these enable us to deal at greater length with the causes of the particular (policy) developments than is the case when using normal indicators. Trend analyses have become a standard feature of the report. In this edition we devote more attention to future developments than previously and, where possible, make broad policy recommendations.

On our MSR internet site you can find, in addition to the background figures for all indicators, further more detailed information about, for instance, the calculation method used. For a large number of indicators, moreover, a further breakdown can be seen by, for example, municipalities. Not only the data, but also the text and even the individual graphs are available for further use. In the coming years the site will be further optimised. The way in which this will be done, and the shape it will take will depend to a great extent on the reactions and wishes of the visitors. An additional option for the future is that we might offer data which does not occur in the printed report.

Within the theme of air quality and health last year we gained experience for the first time in conducting surveys by looking at the expectations for 2010 as well. A survey goes one step further than a trend analysis and looks ahead to a reference point in the future. Incorporating surveys may prove a valuable addition to the environmental policy cycle. This view to the future has been followed-up this year in a number of trend analyses. Moreover, the trend analyses are now used more to identify possible solutions for realising environmental goals. The actual choice and further details of the way in which the environmental goals are to be achieved have to be initiated by the organisations responsible.

In the anniversary edition, a large number of (regional) administrators respond to issues from any of the previously published monitoring reports. The subjects have been grouped into four chapters, preceded by an introduction. For each subject, two people give their personal views about the issues. Via the website it is possible to obtain a copy of this edition at a small charge.

The report retains its characteristic features, such as the cover with the dot on the spine, the layout and presentation of the individual indicators, and the page design.

### **Overview of contents**

The first chapter is entitled 'social context'. It contains disparate indicators which are presented together and should be considered more or less as facts because either they are very difficult to influence at regional level or their placing in the chapter is necessary due to the correlation between them. This chapter is followed by the thematic chapters, i.e. 'air', 'noise', 'soil', 'water', 'waste', 'energy', 'environmental care', and 'external safety and environmental licensing'. One or more trend analyses have been appended to the chapters. These can be found at the end of the chapter in question.

Each indicator comprises a graphic representation and a brief explanation. This facilitates a search for the desired information and at the same time ensures that the coherence is maintained. Whenever possible, we offer this information at the level of indexes (red boxes) which show the situation for a theme in its entirety. Then we also describe the compiling indicators individually (green boxes).

In principle, the indicators in this report provide an account of the situation up to and including 2003. Sometimes, however, data is only available up to 2001 or 2002. This data has only been included in this report when it yields new facts. More information about the indicators may be found on the internet site:  
[www.hetmilieuinderegiorotterdam.nl](http://www.hetmilieuinderegiorotterdam.nl)

Appendix 1 contains an overview of complaints about odour and noise nuisance per regional municipality. Appendix 2 provides a list of documents that were consulted. At the back of the report there is an index of keywords.

## General

The cover of this report has a dot on the spine. This dot has appeared on each of the MSR reports ever since 1995. If all the MSR reports which have been published to date are stood side by side the dots will be seen to show a steady upward trend in environmental quality until 2000, with only a slight downturn in 1997.

The last four years has the dot on the spine of the MSR report remained stable. Some successes have been achieved, but in addition there are also areas still requiring attention. Successes, for example, include the decline in the number of occasions on which received noise levels have been exceeded on zoned industrial sites, the sharp decline in discharges by companies resulting in the goals for 2010 already largely having been met and an increase in the number of companies with an adequate safety management system. Areas requiring attention include air quality, the still increasing environmental pressure from traffic and the cutting up of nature areas by infrastructure.

Environmental monitoring correlates, where possible, indicators and policy objectives to show whether the policy is on track. In deciding that, the following questions have been asked. Have the objectives already been met or will they be if developments continue along their present trend? And are these developments taking place at the desired rate? This summary highlights those elements in each area where the policy is on course or not.

Just as we did last year, we have conducted a trend analysis for a number of themes. We examine in detail one or more aspects of an indicator or subject relating to the theme in question. At the end of this chapter you will find a short summary of this.

### ON COURSE

#### Social context

##### *Park and Rail sites frequently used*

In contrast to the national trend, the occupation of the P+R sites in the region is high and the present number is being increased by eight additional sites.

### NOT ON COURSE

##### *Increase in the number of complaints regarding odour, particulates and noise*

The number of complaints received by the DCMR incident room in 2003 rose by 3,893 (26%) to 18,717. The increase applies not only to odour, as a result of the incident at VOPAK, but also to noise (chiefly aircraft).

## Air

##### *Emissions of acidifying substances decreasing*

Emissions to air of acidifying substances caused by major industry have decreased for the second year running. The target for 2000 has been met. A concentrated effort is required in order to meet the target set for 2010.

##### *Air quality still requires attention*

The general air quality has deteriorated slightly in 2003. At every sampling point the concentrations for ozone, fine particulates and NO<sub>2</sub> were higher in 2003 than in 2002. This was chiefly due to the good weather and low wind velocity which meant that there was little opportunity for the air pollution to disperse. The concentration of NO<sub>2</sub> at the sampling points on average only slightly exceeded the limit value but along busy main roads this limit value was at times considerably exceeded.

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## ON COURSE

### Noise

#### *Decrease in noise pollution at industrial sites*

The number of monitoring points at five zoned industrial sites at which the limit value for noise pollution was exceeded fell from 55 in 1999 to 22 in 2003.

### Soil

#### *Soil quality on the map*

By 2005 every municipality must have a soil quality map. It looks as if nearly every municipality will meet this target: twelve have already drawn up a soil quality map, four are in the process of developing one. Bleiswijk and Bernisse, however, have decided not to develop a soil quality map at all and will therefore not meet the target.

### Water

#### *Nearly all discharges meet the targets*

The quantity of polluting substances in national waterways continues to decrease. The 2010 targets for oil, PAHs and most heavy metals have already been met. For the remaining substances, the targets for 2000 have definitely already been met.

### Natural areas

#### *Wetlands of International Importance*

For a number of years, the combined index value for all the animal species mentioned in this report has remained around 70. The 1% norm for the redshank and gadwall has continued to be exceeded in recent years in the Voordelta and the Nieuwe Waterweg. For this reason these areas have been designated Wetlands of International Importance. The strikingly positive trends which have been evident since 1998 for all the summer birds included in this report appear to have continued in 2002.

### Waste

#### *Separation of waste increasing*

The proportion of waste that is collected separately at regional level has risen from 137 to 151 kilograms per resident. This means that the percentage of waste separated for collection has risen from 28% in 2002 to 30%.

## NOT ON COURSE

#### *Noise pollution increasing*

The nuisance experienced by residents from traffic and industrial noise was considerably higher in 2003 than in 2001. The number of complaints relating to industrial noise was down to 1998 levels but traffic noise complaints reached the highest percentage ever.

#### *Insufficient progress in the cleanup of gasworks sites*

The soil cleanup at former gasworks sites is making slow progress. The locations where cleanup operations still need to occur are sizeable both in financial and spatial terms so that it remains uncertain whether the target to complete cleanup operations by 2023 will be met.

#### *Quality of national waterways decreasing*

The quality of national waterways has decreased as a result of increased amounts of heavy metals in surface water and in suspended solids. This is also due to higher concentrations of organic micropollutants in surface water.

#### *No reductions in fauna bottlenecks*

The number of fauna bottlenecks has remained virtually unchanged since the inventory in 1993. The target for 2000 was nowhere near achieved in 2003 and at the present rate it looks as if the target for 2010 will certainly not be met either. The majority of bottlenecks are caused by roads.

#### *Households producing more waste*

The total amount of waste generated by households in 2003 increased compared to 2002 and now comes to approximately 600 kilotons. This amounts to slightly more than 500 kilos per resident.

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## ON COURSE

### Energy

#### *Municipalities go over to Eco-electricity*

The number of municipalities that has changed over partly or entirely to using Eco-electricity has risen once again. In 2001, only three municipalities were using Eco-electricity, in 2002 there were five and in 2003 this has shot up to twelve. Rijnmond scores high on the national scale.

### Environmental management

#### *Municipal Environmental Policy Plan (MEPP) still being introduced*

With the exception of the municipality of Westvoorne, all the municipalities have an environmental policy plan or are in the process of developing one. A number of the MEPPs in the process of being developed will be established in the course of 2004.

### External safety and permits

#### *More safety management systems adequately developed*

In the framework of the Hazards of Major Accidents Decree 1999 (BRZO 1999) it has been specified that certain companies must have a safety management system (SMS) in place. In 2003, 85% of the companies subject to safety management system procedures where checks were carried out had an adequate safety management system in place. When the first checks were carried out in 2001 this figure was only 56%.

## NOT ON COURSE

#### *Electricity use on the increase*

Households use more electricity every year because both the number of electrical appliances and the intensity of their use are increasing.

#### *Environmental management by municipalities a cause for concern*

Since 1998 it has been compulsory for every municipality to have its own environmental management system (EMS). In 2003 this is still not yet the case in the Rijnmond area. In fact, only seven municipalities have an EMS at present.

#### *Adequate level of measures not yet achieved*

Every major company must have emission-reducing facilities installed in accordance with the best available technology. This is what is termed an adequate level of measures. In 2003, the refineries have attained 40% compliance with this. The storage and transshipment companies and, to a slightly lesser extent, the chemical and waste processing companies still require considerable attention too.

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## Trend analyses

### Decoupling

Economic growth often causes an extra burden to be placed on the environment whereas the intention is in fact that economic growth should be accompanied by a reduction in environmental pressure in real terms. This is called absolute decoupling. If economic growth increases at a faster rate than the growth of environmental pressure we call this relative decoupling. Environmental intensity is a method to measure decoupling and is worked out by dividing the index for environmental pressure by the index for economic growth.

Environmental intensity is calculated for the following sectors: refineries, storage and transshipment, chemical, traffic and power stations.

In not all sectors does the selected economic parameter apply to exactly the same sources as the calculated environmental pressure or is at least to some extent arbitrary. Incidentally, the general trend is not really affected by this.

In all sectors, with the exception of the power stations, absolute decoupling has occurred between 1986 and 2003. This is not the case for the power stations; they have not even achieved relative decoupling. This is connected to the conversion of the Maasvlakte power station from gas to coal. Even though the power station meets all the statutory standards this conversion has nevertheless caused a considerable increase in SO<sub>2</sub> emissions.

### Car restriction zones

The creation of car restriction zones within residential areas (30 km/hr zones and traffic-free zones) and outside the residential areas (60 km/hr zones) are major features of the Sustainable Safety project. Since 1999, municipalities and water authorities have modified a large number of roads in this way. The most important target of Sustainable Safety, i.e. 50% less traffic deaths and 40% less hospital casualties in 2010 compared to 1985 has not yet been achieved, however, although almost all areas are now car restriction zones. A further reduction will have to be achieved through other (infrastructural) measures, such as the creation of additional separate cycle paths but also by reducing the danger posed by lorries and cars to cyclists and pedestrians.

### Emissions to air

#### *Emissions of acidifying substances by the refineries*

The most important acidifying substances are sulphur dioxide (SO<sub>2</sub>) and nitrogen oxides (NO<sub>x</sub>) with SO<sub>2</sub> making up the lion's share.

Within the Province of South Holland the refineries are responsible for 62% of this.

Between 1985 and 2000, emissions of SO<sub>2</sub> by the refineries were reduced by a factor of three. For NO<sub>x</sub> a reduction of approx. 60% was achieved. This is primarily the result of a (partial) conversion from oil-fired to gas-fired processes.

By 2007 all refineries will have to have reduced their SO<sub>2</sub> emissions to the level of gas-fired installations. It is expected that this will lead to a further reduction of approx. 18% compared to 1985 levels. In order to be able to meet the emission limits laid down in the European guidelines, the province has set a target for the refineries for 2010. This represents a total reduction of approx. 10% on the 1985 level. The refineries are to achieve this through taking more rigorous measures, such as desulphurization of the gas emissions.

It is not possible to lay down a reduction for NO<sub>x</sub> because this is going to be dealt with under European emission trade guidelines. It is expected, however, that the emissions of NO<sub>x</sub> will decline because this component will benefit from the measures taken to curb SO<sub>2</sub> emissions.

### Hydrocarbon emissions

Hydrocarbons are an important factor in the formation of ozone. In 1989, a covenant was entered into between the government and the member companies of VOTOB (Association of independent container storage and transshipment companies). This led to a 50% reduction in the hydrocarbon emissions in 1994 compared to 1985. The fact that this is slightly lower than the intended 70% is partly due to an increase in the throughput and the changing nature of the handled products.

The government has entered into agreements with the non-VOTOB companies in the framework of the so-called "KWS-2000" (Hydrocarbon 2000) programme. Over the same period, this has likewise led to a reduction of 50%.

In 2004 a second covenant will be entered into with the VOTOB member companies in order to achieve a further reduction of 34% in 2010 and 46% in 2015/2020 compared to 2002 levels.

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The first step is to be achieved by specific measures and the second by linking all containers over 1.000 m<sup>3</sup> to vapour processing systems.

#### **Emissions by waste incineration installations**

In the eighties, the waste incineration installations were a major source of air pollution. In addition to SO<sub>2</sub> and NO<sub>x</sub>, large quantities of heavy metals and dioxins were released. With the introduction of flue gas scrubbing in 1993, a drastic reduction in these emissions occurred.

Since 1996, emissions have remained at such a low level that no further adverse effects are to be expected from them.

#### **Soil**

Just as in other policy areas, the influence of the European Union on soil policy is increasing. This has led to a further expansion of the soil policy to include, for example, archaeological and geological values via the Treaty of Malta. In the Netherlands, State Secretary Van Geel has announced his intention to introduce a new Soil Test, in addition to the existing Water Test, and the focus is shifting increasingly from soil cleanup to sustainable soil use. This development, which still has largely to be elaborated in legislation, means that there will also be modifications in soil monitoring.

#### **Water**

The heavy metals copper and zinc occur in excessively high concentrations in surface waters, in suspended solids. The sources which are responsible for the presence of zinc and copper are found partly in Rijnmond, but lie chiefly outside Rijnmond and even outside the Netherlands. In any case, a distinction can be made between point sources, such as industry, and diffuse sources, such as shipping traffic.

Within the region, good results have already been achieved in curbing the discharges of copper and zinc by companies and from the sewage purification plants. The greatest gain within the region may be achieved, it is expected, by further tightening the requirements for the sewage purification plants and by municipal policy in the field of sustainable building. To a great extent, however, we remain dependent on measures in Europe and on national policy. At a national level policy might be aimed at animal feed and paints used for ships, for example.

#### **Summer birds**

For this theme an analysis has been carried out of the summer birds in Rijnmond. The birds used in the analysis are the blackbird, willow warbler, lapwing and reed warbler. Each of these species is characteristic for a particular area: the blackbird for urban areas; the willow warbler for dry countryside areas; the lapwing for agricultural areas and the reed warbler for water and marshland. The variations in the populations are mapped for each species and the probable reason for the increase or decrease in numbers.

#### **Old paper and cardboard**

The trend analyses in the previous report related to the collection of household waste, and a distinction was made between Rotterdam and the other Rijnmond municipalities. Attention was only briefly devoted to the various waste streams within household waste. In the trend analysis that has been included in this report, one of these streams has been focused on in detail, i.e. old paper and cardboard. At a regional level, approx. 40 kilograms per resident per year are collected whereas the target is approx. 70 kilograms. A number of instruments are available to help achieve the target. The most successful of these is likely to be to expand the number of collection methods. This could perhaps be combined with sorting analyses and population studies.

#### **Enforcement**

In recent years, in a similar way to the permitting process, enforcement has developed from meeting targets to being aimed at efficiency and environmental gains. After all the regional municipalities had reached an adequate level in 1997 and there were no more stragglers, the focus shifted to seeking cooperation between various enforcement organisations in order to further professionalise enforcement (the theme of the MSR2002 report). In the meantime, both at local and at regional level, an enforcement structure is now in place which includes building and housing inspection and the enforcement of land-use planning.



Public authorities, companies and households all have a responsibility, in their own way, as far as caring for the environment is concerned. The nature, extent and the development of environmental pressure depends in part on economic activities and social developments in the region. In this chapter we focus on the indicators which sketch a picture of those activities and developments in particular.

## Population

The growth of the number of people living in the region and (perhaps even more important) the corresponding number of households, form important social indicators which, certainly at regional level, must be seen as important data.

Residents can bring their complaints, reports and questions about environmental matters to a large number of municipal, regional and national bodies. In this report we will deal with the reports and complaints which have come in to the joint Municipal Health Service, the Rotterdam-Rijnmond police and the DCMR incident room. In addition to these bodies, from 8 November 2003 road users can air their questions, irritations and tips about road works and other matters to do with the Dutch motorways on the Department of Public Works and Water Management's national information line. This line can also be used for environmental complaints. Information regarding the complaints which are received by the inland waters authorities have been included in chapter 6 (water).

Once every two years the province conducts an environmental perception study in which they ask residents about their experiences in the sphere of environmental nuisance. Eight locations in the Rijnmond region are involved in this (five in Rijnmond Noord and three in Rijnmond Zuid). These are what is known as bottleneck locations where most nuisance from industry is expected. The most recent study took place in May 2003. You will find the indicator for the overall environmental perception in this chapter. Chapters 3 (air) and 4 (noise) look at the odour and particulate nuisance, and noise nuisance respectively. This also applies to the complaints received by DCMR's incident room about these topics. The environmental perception study also asks questions about people's concerns about a potential industrial accident. You will find this indicator in chapter 11 (external safety and licensing) together with other information about external safety.

## Environment and economics

Environmental policy is aimed at decoupling economic growth and environmental pressure. This is evident when economic growth is accompanied by a reduction in environmental pressure (absolute decoupling) or when economic growth increases at a faster rate than environmental pressure (relative decoupling). We can show the degree of decoupling by dividing the index for environmental pressure by the index for economic development. The resultant figure is termed environmental intensity. The more sharply the line drops, the greater the degree of decoupling that has been achieved. If the line rises, this indicates a situation of coupled growth. In the trend analysis at the end of this chapter, we take a closer look at the developments in environmental intensity for the following five target groups: refineries, the chemical industry, power stations, storage and transshipment, and road transport. These target groups are jointly responsible for roughly 80% of the environmental pressure in the region.

## Traffic and transport

Road traffic is a diffuse source of pollution which makes it difficult to tackle; what is more, social resistance forms a complicating factor. This year, the environmental pressure exerted by passenger and goods vehicles has once again been "encapsulated" in an index which is composed of a number of indicators.

Regional policy as described in the Regional Traffic and Transport Plan 2003-2020 (RVVP) addresses itself to promoting an integral policy on vehicle use. This means that the policy is no longer directly aimed at restricting the number of kilometres driven or promoting alternative forms of transport to the car, such as the bicycle and public transport.

In the chapter on "air" we have incorporated indicators about the emissions from road transport and in the chapter on "noise" we address the subject of received noise levels. Information about reduced car access areas (30 km/hr zones and car-restricted residential areas) and 60 km/hr zones has been transferred from chapter 10 (environmental care) to this chapter, so that all the indicators which relate to traffic and transport are in one place. This makes the correlations more obvious. A trend analysis for this topic has been included at the end of this chapter.



Since 2001 the Air Quality Decree, in which the European regulations are laid down, has applied to a number of substances. This Decree contains limit values for, among other things, fine particulates and nitrogen dioxide (NO<sub>2</sub>) which have to be met by 2005 and 2010 respectively. The presence of these and other polluting substances in the air forms an important indicator for the quality of this environmental compartment.

### Quality

The air quality in Rijnmond is measured at a large number of sampling points in the region. The general air quality has improved over the last decade but showed a slight downturn in 2003. This was due to the exceptionally good weather. The average wind speed was the lowest for years, which meant that there was barely any dispersal of the air pollution. Although the concentrations of NO<sub>2</sub> and fine particulates at the sampling points almost comply with the limit values, it is an established fact that concentrations of these will certainly be higher along busy arterial roads and it is highly likely that limit values there will be well over the maximum. The concentrations of ozone were also much higher due to the extensive amount of sunshine and the number of smog days was higher than in previous years. The concentrations of SO<sub>2</sub>, benzene, lead, and benz-a-pyrene no longer cause problems anywhere in Rijnmond.

Every two years, in May, the Province of South Holland carries out an environmental perception study among its residents. Eight locations in the Rijnmond area which lie in the neighbourhood of major industrial companies are involved in the study. It has emerged from the study that the percentage of residents who experience nuisance from odour or particulates caused by industry, and odour nuisance from traffic, was markedly higher in 2003 than it was in 2001. An incident at VOPAK created a peak in complaints about odour received by DCMR's incident room.

### Effects on health

In 2002 in the framework of MSR an extensive study was carried out into the effects of air quality on health. It is an established fact that fine particulates, nitrogen dioxide and ozone in the air can have a negative effect on the airways and the cardiovascular system. In this report for the first time an indicator has been included for the relationship between the concentrations of fine particulates and ozone in the air and premature death.

It has been shown that, due to their tiny diameter, fine particulates can penetrate deep into the airways causing a range of health problems. Particulates in exhaust fumes from diesel engines are particularly damaging. A distinction may be made between effects which occur during or shortly after exposure to high concentrations and effects which occur after long-term exposure to low concentrations. The effects from short-term exposure are usually of a temporary nature, but for people who are already in a weakened state of health due to lung or heart disease, even short-term exposure can result in death. In other words, these people die a few weeks or months earlier than they would have if they had not been exposed in this way. This has emerged from numerous studies carried out over the last decades in which this dose-effect relationship has been established. On the basis of this it has been calculated that in Rijnmond between 400 and 500 people per year die prematurely. In addition, people also die prematurely as a result of prolonged exposure to average concentrations of fine particulates. Through aggravation of the existing lung or heart disease, life expectancy may be shortened by a few months up to a maximum of two years. It is estimated that in Rijnmond this involves between 1,200 and 1,500 per year.

### Sources

The two trend analyses at the end of this chapter examine the expected developments of the emissions of hydrocarbons by the storage and transshipment companies and of acidifying substances by the refineries. We also discuss the emissions from the waste incineration installations over the last few years.

### Efforts

In Overschie from April 2002 until the end of February 2003 an experiment was conducted on the A13 in which a maximum speed of 80 km/hr over a 3 kilometre section of road was put into effect and was stringently enforced. This meant the traffic flowed more evenly. The NO<sub>x</sub> emissions decreased by 15-25% and the emissions of fine particulates decreased by 25-35%. This led to a decrease in concentrations in the air of 3-5 microgram/m<sup>3</sup> for NO<sub>2</sub> and 1-3 microgram/m<sup>3</sup> for fine particulates in the immediate surroundings of the motorway. A positive side effect of this measure is that the received noise level for the people living in the neighbourhood of the road has been reduced. The measure has since come into permanent force. Comparable measures are now being explored for sections of the A16 and A20.



Noise is one of the most important sources of nuisance and can even cause health problems. Thus rules exist regarding the construction of housing in the vicinity of companies and for the amount of noise which companies are allowed to produce. Statutory limits have also been set on road and rail traffic as important sources of noise nuisance. How the disturbance is experienced, incidentally, depends not only on the noise level but also on the nature of the noise. For example, noise from road and rail traffic is experienced as less disturbing than noise caused by industry and aircraft noise.

MSR is currently conducting a study into the relationship between noise and health. One or more indicators will arise from this which will enable us to monitor it in the future.

## Quality

The complaints about noise form an important instrument in localising the source of the nuisance and subsequently taking action to combat it. The classification according to type gives an impression of the most important sources. Moreover, the Province of South Holland conducts an environmental perception study among the residents every two years, in May. Eight locations in the Rijnmond area which are located in the neighbourhood of major industrial companies are involved in the study. The percentage of residents who experience disturbance from noise caused by industry and traffic was found to be considerably higher in 2003 than it was in 2001.

## Sources

In the period from June 2003 to the end of February 2004, DCMR was commissioned by the Rotterdam Port Authority NV to conduct a study into the received noise levels in Oostvoorne. The reason for this was the stream of complaints that has been coming in for years about companies on the Maasvlakte and in the western part of Europoort as well as the (rail) traffic related to it.

The following aspects were considered in the study :

- \* the complaints received; a complaint is a subjective and active expression of disturbance
- \* the results from an environmental perception study conducted by the province; these also reflect a subjective, though not active, expression of disturbance
- \* the outcomes of measurements and calculations which provided an objective picture of the received noise level

From the study it has emerged that most of the complaints relate to noise from companies, the railway and from air traffic.

From measurements and calculations it appears that the statutory standards are not being exceeded. Most disturbance occurred when there was no disguising background noise, caused by, for example, tourists and local traffic. Low-frequency noise and the distinctive noise from the EMO transshipment company were found to be particularly disturbing; the fact that this type of noise is not expected in this rural setting plays a role in this. Furthermore, the residents of Oostvoorne appear to be more critical of industrial noise than other residents in the Rijnmond region. The complaints which relate to disturbance from air traffic are due to the fact that Oostvoorne is situated on the approach route to Schiphol and aircraft waiting for permission to land tend to 'queue' in the air space above Oostvoorne.

The results of this study are certainly also relevant in connection with the future utilisation of the second Maasvlakte which will cause an increase in the noise levels of up to 4 dB(A) for the various types of noise. This will lead to additional annoyance and sleep disturbance. This also applies to the rail traffic over the Suurhoff Bridge which will become more frequent.

The measurements in the study were carried out using mobile monitoring stations. The future developments could provide a reason to set up a permanent monitoring station in Oostvoorne.

Within the Rijnmond area there are three noise-sensitive areas: Voorne's Duin, Rhoon Zuid-Oost and Beninger Slikke. In this report for the first time we show where the 40 dB(A) limit is exceeded as a result of traffic or industry noise. Beninger Slikke is the only area where this is not the case.

## Efforts

At five zoned industrial sites in the region the received noise levels are measured and monitored at a number of locations. The number of locations where the limit values are exceeded decreased from 55 in 1999 to 22 in 2003.

The RANOMOS system (Rotterdam Airport Noise Monitoring System) measures the noise level at six points around Rotterdam Airport. The noise measured can be correlated with information about the flight path of the aircraft flying overhead at that moment and with any complaints that may have been received regarding this flight.

In this way the probable causer of the aircraft noise can be pinpointed and it can also be ascertained whether this aircraft has deviated from its route.

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The RANOMOS system performs an important warning function for the competent authority, the Committee for the Environmental Protection of Rotterdam Airport. In addition, it has also proved to be a useful and objective instrument in the framework of the plans for extending the airport's opening times.

A good overview of soil quality will not be available until 2005 when all the soil cleanup locations within the framework of the 'Focus on Soil' project will have been examined. This is why this chapter does not contain any indicators for soil quality. For these you should refer to the soil quality charts made by an increasing number of municipalities in the region. We place emphasis on their efforts to examine locations and where necessary to clean them up.

The policy area 'soil' is characterised by a multitude of rules and financing instruments which are partially integrated into other policy areas. In this introduction, therefore, we first focus on the most important changes in the financing structure and executive powers. The trend analysis sketches a picture of the future developments and the consequences of these for monitoring the soil policy.

Following the introduction of the Urban Renewal Act large portions of the national budget for soil cleanup were transferred to the Urban Renewal Investment Budget (ISV). As a result of the differentiation between rural and urban areas, a fundamental amendment in the allocation of the soil budgets was created. Powers and tasks were decentralised to local authorities. In addition to the provinces and major cities, 'direct councils' now also constitute a competent authority under the Soil Protection Act. Schiedam will become one of these as from 2004. Furthermore, there are 'programme councils' which will undertake the programming and implementation of soil surveys as well as cleanup operations but which have to apply for a budget from the province per programme period. The municipalities concerned are Capelle aan den IJssel, Ridderkerk, Spijkenisse and Vlaardingen. The remaining 'project councils' can apply for and be granted a budget per project. On behalf of the Province of South Holland, DCMR examines how many third parties invest in the improvement of soil quality compared to contributions furnished by government for programme and project councils. The first cleanup operations within the ISV period have taken place in Schiedam, Vlaardingen and Hellevoetsluis.

In the meantime, negotiations are underway regarding the second ISV period, 2005-2010. The developments so far indicate the following policy changes:

- \* there will probably be drastic cutbacks to the budgets available (20-30%);
- \* the cleanup targets will be less ambitious;

- \* the final deadline for tackling all socially and/or environmentally urgent cases will probably be extended from 2023 to 2030.

In the course of 2004 it will become clear how matters will develop.

House-building on contaminated sites is threatening to grind to a halt because of the complexity of rules and the cleanup costs which put pressure on plan development. This is why within the region it has been decided to contribute from regular Soil Protection Act funds and from extra bottleneck funds towards the soil cleanup costs for contaminated sites where house-building occurs within the Vinex period. In addition, the competent authority under the Soil Protection Act has entered into specific agreements regarding the conditions under which costs are deducted in order to simplify the complicated regulations relating to this particular area.

#### **Households' efforts**

Information regarding the cleanup of underground oil storage tanks at private homes is not included in this report. On 8 October 2003, the 'final' underground oil storage tank in Rotterdam was cleaned up. Since 1996, more than 2,100 tanks in Rotterdam have been cleaned up. At present, a lot of tanks are dealt with as soon as an owner sells his house. Most municipalities have carried out a (final) 'tank campaign' so that the emphasis now lies far more on the monitoring and enforcement of the BOOT 1998 (Underground Tanks (Storage) Decree 1998) than on cleanup operations. The greater part of the monitoring has been transferred to DCMR.

#### **Companies' efforts**

In contrast to private homes, a large number of the underground storage tanks on industrial premises remain in use. The number of tanks declines every year but some sectors, such as petrol stations, continue to utilise underground tanks. It is difficult to assess how many of these there are. Monitoring compliance in the region with the BOOT 1998 is a task performed by DCMR.

On 11 June 2001, a Covenant on soil cleanup for industrial sites operational both currently and in the future was signed between the Ministry of Public Housing, Spatial Planning and the Environment, the Ministry of Economic Affairs, the IPO (Interprovincial Consultation Body) representing the Provinces, the VNG (Association of Dutch Municipalities), and the interest groups VNO/NCW and MKB-Nederland.

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This covenant forms the basis of the Industrial Regulations on Soil Cleanup which are designed to grant government subsidies to companies which carry out soil cleanup operations at their site. The subsidy percentage depends on the point in time when the contamination occurred and the date when the site was acquired. The regulation will be promoted among industry by the South Holland Organisation for Soil Cleanup on Industrial Sites (BSB). Although there was a decrease in the number of companies with an agreement in 2001, this was because some of the companies which had joined ultimately failed to submit a site report. By the end of 2003, more than 2,500 companies in the region had signed an agreement with the BSB South Holland Organisation.

#### **Local government efforts**

All competent authorities under the Soil Protection Act should have systematically categorised their stock of work by no later than 31 December 2004. It is expected that the region will be able to meet the national requirements on time. After all, the majority of municipalities now have a soil information system or a soil zone chart on the basis of which soil movement may take place outside the cleanup locations. Furthermore, the competent authorities are examining the cleanup locations.

The impact of the European Union on legislation and regulations is increasing in nearly every environmental area. For the policy area 'water' the framework directive on water was laid down on 22 December 2000 and this must subsequently be converted into national legislation in every country by 2004. Another important development is that the organisation of both water quality and water quantity management in Rijnmond in the coming years is going to change dramatically. We will discuss these changes and then focus on water quality, sources and efforts to improve the quality of the water.

The framework directive on water covers the protection of the quality and quantity of surface water, groundwater and seawater. Before this directive was initiated, the European policy took the form of a great many separate guidelines; these will now be largely revoked. Broadly speaking, the directive means that the Netherlands must be divided into river catchment areas and that for each area measures must be elaborated into a river catchment area management plan by the end of 2008. The measures should ultimately result in the water being in good condition by the end of 2015. The directive also states what is meant by 'in good condition' for the various categories of water, i.e. for groundwater or for surface water in rivers, in lakes etc.

In the discussion on organisational changes, the division into river catchment areas also played a role. First we will review the current situation. At present, there are four bodies in Rijnmond which monitor the water quality. The Department of Public Works and Water Management is responsible for national waterways (roughly speaking, these are the waters which are open to the sea). The high council of landholders of Schieland and Delfland together with the Hollandse Eilanden en Waarden water treatment board monitor the quality of the remaining waters, i.e. the inland waters. The Water Boards of Brielse Dijkkring and IJsselmonde are responsible for the water quantity management of the inland waters on the islands of Voorne-Putten and Rozenburg and on the island of IJsselmonde respectively. Finally, the high council of landholders of Schieland and Delfland deal with both the quality and the quantity of the water in their area. In the south of the region the Hollandse Delta water board will be formed on 1 January 2005. The following water boards will merge into it: the Brielse Dijkkring, IJsselmonde, Goeree-Overflakkee, Groote Waard and the Hollandse Eilanden en Waarden water treatment board.

This new water board will also be temporarily entrusted with the water quality management in the Alblasserwaard and the Vijfheerenlanden polders.

## Quality

In this report we show the quality of the national waterways and the inland waters in two separate indexes. To create these indexes we collate a number of characteristic indicators to produce one figure. Each year, for each indicator we calculate the distance (as a percentage) from the objective; the average of these distances provides the index for that year.

As an index for the quality of the national waterways, we present in this report the ecotoxicity conservation level regarding exposing aquatic organisms to concentrations of toxic substances. The indexes for the Noordrand (including Nieuwe Maas, Oude Maas and Nieuwe Waterweg) and the Zuidrand (including Spui and Haringvliet) have been calculated separately because they are separate water systems.

In determining the conservation level we use two terms: maximum permissible risk level (MTR) and negligible risk level (VR). Consistent with policy an MTR has been selected per toxic substance so that 95% of a potentially present species within an ecosystem is protected. In addition, a VR is laid down per toxic substance so that 100% of a potentially present species within an ecosystem is protected. In the third National Environmental Policy Plan it was laid down that the MTR level must be met by 2000 and the VR level by 2010.

An important instrument for complying with the obligations of the European Union's framework directive on water (that all waters must be in a good condition by the end of 2015 at the latest) is the water test. The water test was embedded in the Decree on spatial planning of 3 July 2003 and involves all water management aspects being considered in spatial planning and subsequent decisions. Water management aspects include such things as safety, sewerage, water supply, public health, soil subsidence, excessive groundwater levels, surface water quality, groundwater quality, drought and wet habitat. This means that the author of a spatial plan has to involve the water authorities at an early stage in the planning. It is expected that the additional attention will have a positive impact on the water quality in the area in question.

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For the first time indicators have been included relating to the complaints which have been received by the inland waters authorities, i.e. the Hollandse Eilanden en Waarden water treatment board and the high council of landholders of Schieland. The registration systems used for this are not comparable so the data has been included as two separate indicators.

### **Sources**

The large companies have already met virtually all targets for discharges. Incidentally, the figures relate to 2002 since more recent figures are not available. For discharges of the eutrophication elements phosphate and nitrogen the objective for 2000 has been reached. For the remaining discharges, heavy metals, PAHs, (polycyclic aromatic hydrocarbons), EOC (extractable organic chlorine), benzene and oil, the objectives for 2010 have already been met. The only exceptions to this are the heavy metals copper and zinc. These are looked at in more detail in the trend analysis at the end of this chapter, where a link is drawn between the quality and the (regional) sources.

### **Efforts**

Most municipalities either have a valid municipal sewerage plan (GRP) or are in the process of updating one in consultation with the water quality board. The GRP includes the municipality's proposals to improve water quality, for example to provide sedimentation storage facilities, to take care of the connection of premises up to the sewage main and the remediation of hazardous discharges to open waters. There are virtually no more hazardous discharges to open waters in the region and solid progress is being made in the connection of premises to the sewage main. So things are improving. We have not provided an indicator for the sedimentation storage facilities. An effective comparison is not possible since facilities of this sort are not relevant for every municipality. To what extent all the efforts will help to improve water quality remains to be seen over the coming years. After all, there are countless factors that affect water quality.

A large number of the municipalities and also some of the Rotterdam districts have an urban water plan. This is closely linked with a GRP. A municipal water plan is concerned with an integral approach to the surface water inside the municipality's built-up area. The parties involved in the planning process are not only the municipality, the water quality board and the water quantity board but also other stakeholders.

Incidentally, the nature of the water plans has changed over the years; whereas the first water plans were mainly concerned with improving the water quality through a combination of emission-restricting measures, the goals of the recent water plans are more diverse (no longer just water quality, for example, but also water quantity, recreation and wildlife), the type of measures have become broader and the scale of the projects is increasing.

One of the first municipalities to produce an urban water plan was the municipality of Spijkenisse, in 1998, after an intensive preparatory process. Subsequently, in the period between 1998 and 2001, a large part of the proposed measures were implemented. The measures were aimed at more extensive emission reduction as well as at improving the construction and maintenance condition of the watercourses. For example, extra storage facilities were built, a flushing plan was drawn up for the separation of inland water and salt water areas, large-scale dredging operations were carried out and river banks were laid out in a wildlife-friendly way. From the evaluation it appears that the water plan has worked because the water quality has improved dramatically.

The municipality of Rotterdam has a more recent urban water plan for the whole municipality and the Rotterdam districts are also working on making their own water plans. Compared to the Spijkenisse plan, the Rotterdam plan contains some additional items such as flood prevention, water emergency measures and promoting recreational opportunities.

At national, regional and municipal level in the Netherlands, a large number of organisations and volunteers are engaged in observing and counting birds, reptiles, butterflies and plants among others. In this report we devote attention to just a small selection of species which are representative for the region or indicative of certain types of habitat. First we describe the quality characteristics of the wildlife habitats whereby we focus in some detail on the monitoring systems which were used in the making of this report. This is followed by an overview of the efforts which have been made to ensure that the wildlife continues to thrive.

## Quality

In the Zoute Delta water birds are counted on a monthly basis in the context of the Biological Monitoring Programme for national salt waters. The counting is conducted by the National Institute for Coastal and Marine Management (RIKZ) in close cooperation with other organisations and volunteers. The entire area comprises the Voordelta, the Grevelingenmeer, the Eastern Scheldt, the Veerse Meer and the Western Scheldt. From the count data it emerges that in Rijnmond, the Voordelta and the Nieuwe Waterweg qualify as 'Wetlands of International Importance' due to the fact that they exceed what is termed the "1% norm" for redshanks and gadwalls. In contrast to the Nieuwe Waterweg, the Voordelta has also been proposed as wetland due to the fact that it exceeds the 1% norm for spoonbills, scaup ducks and grey plovers in addition to the abovementioned redshanks and gadwalls. The 1% norm refers to the fact that more than 1% of the total Northwest-European population of a particular species occurs in a specific area in a season. In order to determine the population of the common tern, for example, in 1979 the RIKZ set up the Delta Coastal Summer Birds Programme. Since 1990 this programme has been part of the biological monitoring programme of national waterways implemented in the framework of the MWTL (Monitoring the National Water Situation). In this programme, the RIKZ looks at both the salt waters and inland waters such as the Haringvliet. The figures in this report relate to birds counted in areas which border or on lie within the Voordelta/Haringvliet.

The occurrence of common and rare summer birds has been monitored since 1984 by the Summer Bird Monitoring Project (BMP) organised by SOVON in cooperation with the Central Statistical Office (CSO). Annually, in a large number of random (sample) survey areas a fixed selection of species is listed with the aid of extensive habitat mapping.

For this report the variations in the numbers of blackbirds, plovers, willow warblers and reed warblers have been analysed. More details can be found in the trend analysis at the end of this chapter. The Province of South Holland coordinates the monthly counting of the winter visitors for the whole Province of South Holland in cooperation with other organisations and volunteers.

The consequences of the construction of the second Maasvlakte for, among other things, the flora and fauna in the dunes of Voorne will need further attention devoted to them in this report in the coming years. We have given an initial impulse to this by focusing attention on the number of sand lizards in the dunes of Voorne. This species, which appears on what is termed the 'red list', is particularly sensitive to the openness of the dune landscape. If the sand-drift decreases so that the dunes become more densely covered, it is expected that the number of sand lizards will dwindle.

## Efforts

Based on the living environment objective, in the context of ROM-Rijnmond it has been agreed that in the Rotterdam region 1,750 hectares of wildlife and recreation areas must be realised. 750 of the total number of hectares reserved for wildlife and recreation were linked to the construction of the second Maasvlakte. One of the conclusions reached by the Rotterdam regional council of governments from an evaluation of its green policy is that due to a lack of adequate funding, progress here has ground to a standstill. From 1 January 2004, the Ministry of Agriculture, Nature Management and Food Quality has reintroduced the compulsory purchase of areas which lie within the national ecological network (EHS). This obligation is laid down in the Nature Management Subsidy Regulation (SN), and on the basis of the Agricultural Nature Management Subsidy Regulation (SAN) management agreements can be made with farmers. Furthermore, the Province of South Holland has made available an additional 15 million in 2003 to resolve difficulties in land acquisition for the design of the rural area. In this way they want to ensure that by 2013 an unbroken network of wildlife habitats has been created.

In addition to the amount of wildlife areas, the connections between them are of great importance for the interchange of flora and fauna populations. Setting up these connections, however, is an uphill struggle due to technical difficulties and lack of funds. To give an idea of the location of the wildlife areas and the connection zones we have included a map showing these.



In this chapter we describe the waste collection and waste production in the region. Where the waste originates, households or companies, forms the basis for this. In the case of household waste we first take a close look at the national policy amendments and their consequences for the local authorities. The two trend analyses which are shown at the end of this chapter deal with the collection of household waste in Rotterdam and in the other municipalities in Rijnmond. For this report we have chosen to focus in more detail on one of the components of household waste, i.e. old paper and cardboard.

### Households' efforts

In the early nineties, the separate collection of vegetable, fruit and garden (GFT) waste was brought into operation nationwide. An important reason for this was that as a result of the separate collection and composting of the GFT waste components, less organic material needed to be landfilled. In 1994, the statutory obligation to collect GFT waste separately was introduced. In the Environmental Impact Assessment (EIA) of the LAP2003 extensive research was conducted into the environmental effect of composting versus the incineration of GFT waste. The various options offered by all the techniques currently in operation are more or less of equal value from an environmental viewpoint according to the environmental impact assessment.

In September 2004, the Consultative Committee on Waste (AAO) will report on the future of the management of GFT waste to Pieter van Geel, State Secretary for the Environment. The AAO will probably advise the State Secretary to remove the present obligation to collect GFT waste separately from the Environmental Management Act. It will then be up to municipalities to decide whether and if so how they will continue with the separate collection of GFT waste. The expectation is that most municipalities will continue with the separate collection of GFT waste because they will be bound for years to come by contracts for composting this waste. Moreover, citizens are attached to separate waste collection and in many cases separate waste collection is cheaper than alternative forms of collecting and processing.

Since 13 August 2003, households have been able to hand in, free of charge, old electrical goods and white goods at the municipal environmental stations. Prior to this date, you sometimes had to pay a fee for this service. The goods comprise such things as fridges, televisions and washing machines, but also fluorescent lighting and low-energy light bulbs.

A scheme was already in place whereby retailers took back such items as fridges, televisions and computers. For fluorescent lighting and low-energy bulbs there is now a similar scheme whereby consumers pay a waste processing charge when they buy a new electrical good. On 1 April 2004 a similar system was introduced for car tyres. The consumer pays 2.00 extra per tyre and this pays for the old tyre to be sent back to the importers and producers who subsequently take care of the recycling.

On 4 December 2002 the parties in the Consultative Committee on Waste (AOO) laid down the new municipal targets for waste separation. These targets are broken down according to the degree of urbanization and take account of what is feasible for the various types of municipality.

Guidelines for division per component						
Kilo/resident/year						%
Urban classification*	Vegetable, fruit and (GFT) waste	Paper	Glass	Old clothing and textiles	Small-scale chemical waste	Separated
Intensely urbanized	35	60	20	5	2	43
High urbanized	85	75	23	5	2	53
Moderately urbanized	105	85	23	5	2	56
Slightly urbanized	125	90	23	5	2	60
Non-urbanized	140	95	23	5	2	60

\* Intensely urbanized: Rotterdam, Schiedam and Vlaardingen  
 Highly urbanized: Capelle aan den IJssel, Krimpen aan den IJssel, Maassluis, Ridderkerk and Spijkenisse  
 Moderately urbanized: Barendrecht, Hellevoetsluis, and Rozenburg  
 Slightly urbanized: Albrandswaard, Bergschenhoek, Berkel en Rodenrijs, Bleiswijk and Brielle  
 Non-urbanized: Bernisse and Westvoorne

The most important of these targets is the percentage of waste that is collected separately. This emphasises the importance of sorting analyses conducted by municipalities. On the basis of the results of sorting analyses, an insight can be gained into the degree of success in collecting the various components and their corresponding optimisation options. From the Rotterdam sorting analysis it appears, for example, that in the remaining waste the most important components are GFT waste (35%) and old paper and cardboard (18%), whereas the amount of glass (5%) and old clothing and textiles (0.7%) is relatively limited. Of the total amounts of GFT waste and old paper and cardboard, 21% and 25% respectively are collected separately, whereas the national targets are 55% and 85%.

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This type of data can help a municipality to decide on the deployment of resources at local level. A population survey can help here because a picture emerges from this of what citizens need. The AAO has produced a useful guide to both the sorting analysis and the population survey.

In order to achieve a comparison, this report looks at the extent to which the municipalities meet these differentiated targets. In the targets the AAO assumes a secondary separation of 5%. On 11 June 2003 State Secretary Pieter van Geel opened the separation installation in Rozenburg which processes 600 tons of bulky (household) waste a day. Ultimately, over 90% of the bulky waste that comes into the installation is separated there. Seeing as the unseparated bulky waste comprises 5-10% of the total amount of household waste and virtually all the bulky household waste goes to Rozenburg, the AAO's target for this is amply achieved.

As far as we know, the collection of old clothing and textiles by charitable organisations such as Humana, KICI and the Salvation Army has been incorporated into the proffered results whereas the collection of batteries by the Stibat (Battery Organisation) has not. In 2003, the Stibat collected about 35 tons of batteries from retailers, builders merchant's, schools, camp sites and bungalow parks.

In the trend analysis we focus in more detail on the development of separate waste collection for old paper and cardboard.

#### **Companies' efforts**

In 1998 the Western Agriculture and Market Gardening Organisation (WLTO) in Rijnmond among other parts of the Netherlands held a collection campaign for free-lying asbestos ("loose asbestos") from farmers. Over the whole region during this campaign a total of 204 tonnes of asbestos was collected from 324 companies. In 2001, as a follow-up to this, the WLTO launched a pilot scheme in West Friesland to also remove of building asbestos (asbestos that is attached to other materials). The campaign turned out to be so successful that it was decided to expand it to South Holland. This was started during 2003. By the end of 2003, 38 companies had joined the campaign but of these a total of 14 have since withdrawn. Of the remaining 24 companies, 21 have signed a contract and 10 companies have already completed the campaign. An average of about 500 m<sup>2</sup> of asbestos per company has been removed.

The campaign will continue into 2004; it will then be decided whether there will be a follow-up and if so, what form this might take.

#### **Local government efforts**

On 13 February 2004 the SAM subsidy regulation came into force. Municipalities or cooperation initiatives may apply for a subsidy to stimulate separate waste collection, to reduce household waste, and for a project to prevent illegal waste dumping. The municipalities of Hellevoetsluis, Maassluis and Rotterdam have submitted their own application, Capelle aan den IJssel will submit one together with the AVR, and the 3 "B" municipalities (Bergschenhoek, Berkel en Rodenrijs and Bleiswijk) will submit an application together with Irado, their waste collecting agency.

Municipalities or cooperation initiatives which want more insight into the current situation and opportunities for improving separate waste collection and reduction of household waste, may submit a subsidy application for a basic project. The implementation of such a project starts with determining a zero measurement and results in a plan of approach.

Municipalities which already have a sound grasp of the current situation can apply for a subsidy for a 'plus project'. This gives them the financial scope for introducing measures on condition that a solid plan has been drawn up. Novem assesses the subsidy applications after recommendations by the Ministry of Public Housing, Spatial Planning and the Environment, and AAO.

Municipalities or cooperation initiatives wishing to tackle the problem of illegal waste dumping may implement a subsidised project to combat it. This consists of determining a zero measurement and drawing up and establishing a plan of approach. The AAO's guide, Tackling Illegal Dumping, is an important tool in this process.

This introduction to the Energy chapter is largely devoted to a description of the liberalisation of the energy sector and the increasing influence of Europe on energy policy and climate policy. Whereas in the early days of the MSR the subject of energy still formed an almost integral part of the operational management and policy of municipalities, the current situation is that of a virtually totally liberalised market in which a by definition area-bound municipality no longer plays a role. Municipalities no longer exert any direct influence on many targets in the energy and climate policy. The data for indicators is frequently no longer accessible to municipalities, and it is often no longer possible to follow up on signals from a monitoring report due to the changing role of municipalities in the implementation of energy and climate policy. Energy remains the most essential aspect of modern society, however. The environmental aspects, and in particular the emission of CO<sub>2</sub>, form an issue of such scope and significance that working towards a solution has to occur at every level, from the global level to provincial, municipal and individual level. After ten years of monitoring the progress of these campaigns, the need for monitoring continues, but the traditional role and responsibilities of municipalities has changed.

## Liberalisation

In the nineties, in response to two European directives, central government launched a phased process for the liberalisation of the gas and electricity market. The starting point for this liberalisation was characterised by an energy sector in which the government had full responsibility for the production, transport, distribution and supply of electricity, heat and gas to citizens and companies. The essence of liberalisation consists in enabling competition between market parties and introducing freedom of choice for consumers. Given that in this type of free market there is no room for parties with an integral area-bound responsibility for energy, the former municipal energy companies have now been privatised and for the most part, through mergers, converted to major concerns. These energy companies are at present still controlled by the municipal and provincial authorities, but the ultimate goal of liberalisation is the partial or outright sale of these concerns to private parties. The freedom to choose green energy that is now available to everyone has formed an important interim step in the liberalisation process. Major companies, too, are already completely free to enter into a contract with any energy company they choose for the supply of gas and electricity.

From 1 July 2004 this will be possible for everyone and, aside from the energy infrastructure, it will mark the end of the traditional area-bound responsibility for energy.

## Quality

An important aspect of the energy sector which cannot be liberalised is the environmental quality of its product. As in the case of the reliability and efficiency of energy management, both central and local government will always wish to exert an influence on the environmental aspects of the energy sector. Europe also has a strong interest in the energy sector. For example, there is a direct relationship between the burning of coal, oil and gas and the obligation entered into by the EU (in compliance with the Kyoto protocol) to reduce the emissions of greenhouse gases (including CO<sub>2</sub>). The EU also foresees an increasing (and alarming) dependence on the import of these fossil fuels. The EU is thus hard at work on preparing Directives which will affect environmental quality and efficient production and will guarantee the supply of energy. Examples of these are directives on CO<sub>2</sub> emission trade, energy output of buildings, stimulating combined heat and power, biofuels, sustainable energy, energy efficiency and the continuity of the energy supply. All these (and future) directives will be implemented by central government in legislation and regulations. This will create direct obligations for local authorities in most cases, shifts may occur in a municipality's traditional range of responsibilities, but often the impact of the directives will depend on specific regional characteristics. Although the liberalisation will bring an end to the traditional area-bound responsibility for energy, no end is in sight for the involvement of municipalities and provinces in the energy issue. Municipalities not only remain involved in the energy issue in their role as policy implementer, policy maker and energy consumer, but also because they are the party with responsibility for an area's present and future residents and companies. The introduction of liberalisation has brought about a major change in the role of municipalities in the energy issue.

## Efforts

Liberalisation or not, energy is of course still a part of the various implementation aspects of municipal management. A few examples: in many municipalities in the Rotterdam regional council of governments, building activities are taking place on a large scale, or are planned. This means that devoting attention to the energy infrastructure, due to the tightening of requirements for the energy output of buildings, is becoming increasingly important.

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More than 10% of the energy generated by wind turbines now comes from Rijnmond and there are even municipalities which are running on 100% green energy. Another way of setting a good example has resulted (in Rotterdam) in the solar energy power plant on the roof of the Oceanium at the Blijdorp Zoo. This and other implementation aspects of energy will be intensified by a number of municipalities in Rijnmond in the coming years because of the fact that they already are or are planning to take advantage of the BANS Climate Covenant subsidy scheme. The goal of this subsidy scheme is for municipalities (but also the provinces) to actively introduce the energy issue into policy areas other than that of the environment. This means that account will be taken of the energy aspects from sectors such as spatial planning, living, outdoor space, traffic and transport, and parts of municipal operational management (street lighting, company vehicles and purchasing). The activities which can be implemented under the subsidy scheme are largely directed towards influencing and underpinning policy and decision making in these sectors. This method of working produces (side) effects in remaining policy areas which, if the effects are positive, need to be sustained as far as possible in these policy areas. In the future, the issue of energy will thus be integrated still further into the various policy areas.

### **Future**

European directives and central government policy in the field of energy and climate fall under energy policy and climate policy. It is characteristic of both these policy areas that they attempt to unite conflicting interests (affordable and clean, reliable and affordable) and that the goals have to be realised across all sectors of society. For example, there are CO<sub>2</sub> emission limits for industry, the built environment, market gardening, traffic and transport, and sometimes even for individual companies. Market parties have also come into being as a result of liberalisation and these are partly responsible for the relevant long-term social interests. The CO<sub>2</sub> requirements are being tightened and technical developments are taking place at an increasingly rapid rate. This will not make it any easier to harmonise the energy and climate policy in the coming years nor to ensure that the consequences are effectively responded to. Rijnmond's specific situation with its major port and industrial complex means that the European directives, more stringent requirements (lower CO<sub>2</sub> limits) and new (e.g. technical) developments in the field of energy, will have major consequences for the development of Rijnmond.

Moreover, the scale of the energy consumption by companies and residents means that the directives will have a greater impact on Rijnmond than on any other region in the Netherlands. Municipalities will have to review their energy and climate policy. How the municipalities in the Rotterdam regional council of governments respond to current and future legislation and regulation and to autonomous developments in the field of energy will have a considerable influence on the opportunities for this region. The energy chapter is not yet closed.

Just as in the previous chapters, waste and energy, we will again be looking at the efforts in the field of environmental care by households, companies and the provincial and local authorities. Environmental care involves activities which result in a reduction in the pressure put on the environment and which are not regulated through legislation and regulation, but are the result of covenants and self-regulation. Partly due to this, most of the indicators in this chapter have a broader perspective than the indicators in the other chapters.

### Households' efforts

Households can contribute in many ways to a reduction in the pressure put on the environment. These may range from purchasing energy-efficient appliances and solar panels to separating waste and using public transport. Information about these subjects may be found in the relevant chapters above.

### Companies' efforts

In 2003, in the municipalities of Schiedam, Vlaardingen and Ridderkerk, the 'Monitoring of environmental performance by companies' project was concluded. The project, launched in 2001, was aimed at encouraging companies to monitor their environmental performance within the framework of the expanded scope of the Environmental Management Act. The idea was to offer 80 companies in the three municipalities an instrument, the MKB Environmental Barometer developed by Stimular, along with prevention advice so that they would gain more insight into their environmental performance; it was expected that this would stimulate companies to set to work on prevention. In their Environmental Barometer, companies recorded data about their energy and water consumption, waste production, emissions and, if relevant, traffic and transport activities. The data which the companies input into their Environmental Barometer was sent to the municipalities (i.e. DCMR). This project explored the extent to which the data is suitable for tracking the implementation of the expanded scope in companies, and it also examined which indicators are suitable for devising and monitoring more specific environmental policy for the sustainability aspects.

80 companies in three municipalities were selected, based on a number of criteria. In the second year of the project, 71 of the 80 companies remained and of these 49 (nearly 70%) indicated, after a second consultation, that they were willing to use the Environmental Barometer and to voluntarily send their data to DCMR.

More than half the companies participating in this second round appeared to have already taken or were planning to take prevention measures. Of the companies where prevention potential was present, 80% took measures or made plans to take measures. The municipalities indicated that the data from the companies was highly suitable for monitoring activities falling within the expanded scope of the Act and for determining priorities and deploying manpower. This development fits in with the need for more substantive monitoring, to 'aim at targets' and the professionalization of enforcement.

In 2003 a similar project was started at seven companies in the municipality of Maassluis. In 2004 and 2005 these will be expanded by another seven companies per year up to a total of twenty-one participants in 2005. Outside the Rijnmond region, the Province of Zeeland has set up a project using the Environmental Barometer at fifteen companies.

The provincial and local authorities stimulate companies to employ sustainable business practices. The Province of South Holland has stated as its ambition in its 'Underway to sustainable business practices in South Holland' programme that in 2010, 80% of the South Holland companies will have taken diverse steps up the sustainability ladder. From 2002 to the end of 2003 a project for water sports clubs, commissioned by and in cooperation with the branch organisation HISWA, was conducted in South Holland. At the same time a similar project was running in the Provinces of Zeeland and North Brabant. Various companies have seized the opportunity to qualify for the prestigious European 'Blue Flag' certificate.

Companies can also introduce an extensive corporate environmental care system (BIM). Using such a system, environmental care becomes part of the normal company process. This report includes an indicator regarding the degree to which the large companies have their own BIM. Generally speaking, this method is not practicable for smaller companies.

Companies do not only work on sustainability within their own organisation. This also happens on the scale of industrial sites. In various municipalities in the Rijnmond region the business community and local government are working together on making their industrial sites more sustainable. These efforts are aimed both at improving the environment and the investment climate. In Rijnmond there is a shortage of industrial sites.

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An attempt is being made through sustainable building and regeneration of industrial sites to remedy that shortage. In the coming years, the province, the Rotterdam regional council of governments and the municipalities will be looking at ways in which the implementation of existing policy can be strengthened, for example by the specific deployment of financial resources and organisation of the expertise available in the region.

#### **Local government efforts**

By 1998 every municipality should have had its own environmental management system (GIM) but in a large number of cases this has not yet been achieved. Stimular now functions as coordinator and driving force for the GIM network in which all the regional municipalities participate. The municipalities exchange expertise, experience and materials and may also develop joint activities with other participants. The network provides a stimulus for GIM activities in the participating municipalities. Something that has resulted from these activities is the website for environmental management systems by and for municipalities, [www.gimnet.nl](http://www.gimnet.nl). The Rotterdam regional council of governments provides the funding for this site.

Drawing up environmental policy plans is, like monitoring, part of the cycle in which environmental policy is initiated, laid down and implemented. Nearly every municipality now has a Municipal Environmental Policy Plan or is in the process of developing one. Although there is a good deal of correspondence between the basic components of the various plans, there are some significant differences in emphasis, objectives and layout between the various municipalities.

The existence of environmental policy plans means that municipalities will want the environmental monitoring reports to correspond to these. A consequence of this is that the present uniformity is increasingly making way for tailor-made solutions. This not only completes the environmental policy cycle but the relationship between policy plan and environmental monitoring report is made clearer. There is now an even greater need to draw up such reports as a consequence of the dual political system in the municipalities. Due to this, environmental monitoring has now become an important control instrument for the municipalities and Rotterdam districts administration.

A more far-reaching step is the integration of environmental policy plans, monitoring reports, annual programmes and annual reports.

The first municipalities are already working on this and the Rotterdam Noord district has also opted for this approach.

Another development is that an increasing number of municipalities are employing integral and region-specific approaches and that local authorities are being given increasing freedom to take decisions. The most important examples of this are the VROM licenses, LOGO (Local Orientated Guide for spatial Objectives) and the Urban and Environment Experiments Act which will be followed up by the Urban and Environment (Interim Measures) Act. As a consequence of this development, environmental monitoring is moving closer to environmental policy and environment is moving closer to other matters which affect the quality of the living environment, such as social housing, social facilities and spatial planning. This will mean, certainly in the long term, that within monitoring, too, more attention will need to be devoted to (calculating) potential policy options; this shifts the emphasis from steering by numbers to output steering.

In forming policy, municipalities can also get advice from (independent) wildlife and environment organisations such as the Cyclists' Association and the NCDO (National Committee for International Cooperation and Sustainable Development). In their reports, both organisations establish a direct link between monitoring and (policy) recommendations.

To this end, the Cyclists' Association has developed the Cycling Audit which assesses cycling policy in municipalities with more than 20,000 residents. The local branch of the Cyclists' Association, commissioned by the municipality, uses a measuring bicycle to compile data on the quality, layout and location of the cycle paths. In the report, concrete improvements to the cycling policy and the cycle infrastructure are subsequently proposed. All the relevant municipalities in the region have received a Cycling Audit. There is already a successor to this: the route test. The route test has been specifically developed for provinces and municipalities that want to have a section of their cycle network or one or more of their routes specially examined. A trial route test has been carried out in Rotterdam for one of the main cycle routes: Coolsingel-Schiebroek. On the basis of the outcomes of the study, this route will be improved by 2005 at the latest. To what extent this also emerges from the outcomes of the measuring bicycle audit will subsequently be looked at.

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The NCDO has developed the Local Sustainability Meter. This offers an insight into what municipalities have achieved in the field of sustainability in the following theme areas: 'climate policy', 'water', 'global policy', 'space and green areas' and 'social'. Virtually all municipalities in Rijnmond have participated in the Local Sustainability Meter for one or more themes. The successor to this, too, is already available: the World Mirror, in which there is more emphasis on international relations.

Whereas in the municipalities a development can be seen of increasing importance for monitoring, at a national level an opposite tendency can be seen. For example, the Ministry of Public Housing, Spatial Planning and the Environment has stopped asking for all kinds of environmental information from, in particular, municipalities and water authorities via the 'CCO list'. The joint provinces, united in the IPO, have also stopped publishing their 'Environment, Water, Agriculture and Wildlife' report.



## External Safety

On 19 July 1999 the Hazard of Major Accidents Decree 1999 (BRZO 1999) came into effect. This decree addresses itself to the risks of both the transport and the storage of hazardous substances. In this report we examine the situation at the companies in Rijnmond.

The BRZO 1999 lays down which requirements a company must meet if the presence of certain substances on company premises breach the threshold values. Companies which exceed the threshold defined as 'low' must develop a policy to prevent accidents and specify this in a document entitled 'Serious Accidents Prevention Policy' (PBZO document). In this context these are also referred to as PBZO companies. They should also have an operational safety management system (VBS) in which relevant safety aspects are guaranteed by means of procedures. Companies which exceed the threshold defined as 'high' must draw up a safety report (VR) (the so-called VR-companies). A safety report consists of a safety management system (VBS) and a background document in the form of a compulsory quantitative risk analysis.

In the period between 2001 and 2003, inspections were carried out at all companies which come under the BRZO. These inspections were carried out jointly by DCMR, the Directorate General for Public Works and Water Management, the fire services and the labour inspectorate and were extremely extensive, in-depth and time-consuming. This meant that less time was available for conventional preventive inspection activities. For the first time in this report an indicator has been included which provides an insight into the extent to which the BRZO companies have their VBS in order.

A clear improvement can be seen between 2001 and 2003.

This year for the first time an indicator has been included showing the number of reports that fall under the REOV (Registration and Evaluation of Unforeseen Incidents) criteria. These refer to a dangerous situation, emission or spillage (depending on the substance and the amount) or nuisance. Each REOV report is always followed up by further investigation into the cause. In early 2003 a number of major incidents occurred in a short time. For DCMR, this was a reason to call the companies concerned to account.

This has resulted, among other things, in the setting up of the Deltalinqs University by the employers' organisation, Deltalinqs.

Major industrial companies can exchange expertise and experiences via this platform and analyse (near) incidents in order to improve the prevention of incidents.

In May 2003, residents of eight locations in the Rijnmond area which are situated near to industry were interviewed in the framework of the environmental perception study that the province carries out once every two years.

A striking feature was that the percentage of people who indicated that they were worried about an industrial accident was considerably higher than in 2001 and has in fact never been so high. There is no clear cause that can be indicated for this. Generally speaking it is the case that publicity about accidents, including those outside the region, can increase the feeling of anxiety.

Over the last few years a number of platforms have been set up in Rijnmond in which industry, the authorities and residents are represented. One example is the Regional Platform, that addresses itself particularly to regional themes. Furthermore there is a Nuisance and Safety Platform in Voorne, Rozenburg, Hook of Holland, Charlois and Vlaardingen (in the process of formation) and a Shell Neighbour's Council which tends to focus on the local situation. Information is exchanged regarding operational management, for example about the measures taken to prevent nuisance and minimise the risk of accidents, and the consequences of these for the living environment, the safety and health of the local residents. Experience demonstrates that this exchange promotes mutual understanding, dispels unnecessary feelings of anxiety among residents, and results in solutions being sought together. In short, it's a 'win-win' situation.

In response to the firework disaster in Enschede (in May 2000) the Ministry of Public Housing, Spatial Planning and the Environment has drawn up a draft Registration Decree. The competent authority (province and municipalities) has to deliver data on the relevant companies. In 2003, DCMR began an inventory of the companies in Rijnmond which fall into this category. This Decree will come into force on 1 July 2004.

## Licensing

Before a company is allowed to commence activities which could put pressure on the environment, it is compulsory for it to apply for a licence under the Environmental Management Act or to give notification on the basis of an order in council (AMvB).

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An AMvB lays down the environmental regulations for a whole sector. Sometimes the company, depending on the proposed activities, also has to apply for a licence under the Pollution of Surface Waters Act (Wvo).

Once a licence or notification has come into effect, the company is regularly monitored for compliance with the regulations. Highly complex companies, including major industries, and sectors which exert significant environmental pressure, are monitored more frequently than the smaller companies which exert less pressure on the environment.

DCMR Rijnmond Environmental Agency carries out the tasks under the Environmental Management Act on behalf of the municipalities in the region, and for the Province of South Holland for those companies which come under provincial authority. The Directorate General for Public Works and Water Management and the water authorities are responsible for monitoring compliance with the Wvo.

#### **Enforcement**

In 2003 the professionalization of environmental enforcement scenario was started. The first phase of this scenario consisted in determining a national zero measurement for the current level of enforcement based on nineteen quality criteria for effective enforcement. In addition, the goals, strategy and working method, the implementation and the evaluation of enforcement was looked at. As regards the tasks under the Environmental Management Act, it appears that the various components comply to a large extent (60-80%) with the quality criteria. The enforcement of the Soil Protection Act has not been going as long as the Environmental Management Act: only 40-60% of the components there meet the quality criteria. The Directorate General for Public Works and Water Management and the water authorities carried out this investigation for the Pollution of Surface Waters Act. The scores here vary somewhat, from around 30% to over 80%.

In the second phase of the professionalization scenario, DCMR has drawn up an improvement plan for those components which do not yet meet the specified quality criteria. This phase includes in any case the introduction of a closed policy cycle which consists of tightly-meshing goals, strategies, working methods and monitoring aspects. In this context, enforcement indicators among other things will be appointed and a compliance strategy and other compliance instruments will be developed, based on environmental goals.

The elaboration of a compliance index, such as that proposed within the theme of MSR 2002 'Manoeuvring towards tailor-made enforcement', will be included in it.

Since government capacity is limited and the violations are highly diverse, there is a need for shrewd solutions and for cooperation within enforcement. In the Rijnmond region the enforcing authorities have been cooperating for years. In recent years, money and manpower has been allocated in order to give the cooperation a structural character. In 2003 this was realised: during the year efforts were made to maintain and facilitate the cooperation and to deliver the agreed targets. In this context, the Enforcement Service Unit (SEPH) has made a number of proposals for the modernisation of the joint environmental enforcement in the region. Although these leave the main framework of the existing structure intact, it has nevertheless been adjusted to the current need for practical agreements and more results. The administration is thus better able to determine the priorities for cooperation. In short: the goal of the modernisation is to establish administrative priorities for the regional cooperation, to carry out the cooperation in a more practical way, and to make the results more visible. The Enforcement Service Unit (SEPH) has also drawn up a project proposal to monitor the spontaneous cooperation in the Rijnmond region.

## 'The environment in the Rotterdam region 2003'

### Overview indicators per page

Indicator	page	chapter	type	name
MG_8016	24A	2	line	Inhabitants in Rijnmond
MD_7004	24B	2	line	Handling of environmental complaints by Municipal Health Services
MD_7076	24C	2	bar	Environmental complaints police
MB_3085	24D	2	line	Complaints about odour, dust and noise
MB_3058	25A	2	line	Marks for environmental quality
MI_9005	25B	2	line	Index environmental pressure road traffic
MB_4024	25C	2	map	Modal split (choice of transport)
MB_4025	25D	2	map	Modal split (motivation)
MB_3028	26A	2	line	Number of car kilometres driven
MB_4021	26B	2	bar	Kilometres travelled by RET passengers
MB_4036	26C	2	bar	Kilometres travelled by Connexion passengers
MB_4020	26D	2	bar	Rail passengers (stations)
MB_4022	27A	2	bar	Travellers by train (motivation)
MB_4027	27B	2	bar	P+R-terrain (parking places)
MB_4028	27C	2	map	P+R-terrain (occupation)
MB_4017	27D	2	map	Car restriction zones per municipality
MB_4018	28A	2	bar	60 km/hr zones
MI_9004	28B	2	line	Index environmental pressure major industries
	29A	2	line	Environment and economy (power plants)
	29B	2	line	Environment and economy (several sectors)
	30A	2	bar	Car restriction zones and traffic safety
MI_9003	32A	3	line	Index air quality
MB_3075	32B	3	line	SO <sub>2</sub> in air
MB_3072B	32C	3	line	NO <sub>2</sub> in air
MB_3079	32D	3	line	Fine suspended particles
MB_3067	33A	3	line	Benzene
MB_3049	33B	3	line	Benzo(a)Pyrene
MB_3073	33C	3	line	Ozone
MB_3083	33D	3	bar	Signalling codes
MB_3082	34A	3	bar	Smog
MB_3001B	34B	3	line	Odour, complaints
MB_3087	34C	3	map	Odour, complaints per municipality
MB_3088	34D	3	map	Dust, complaints per municipality

MB_4029	35A	3	line	Experienced air quality
MB_3020	35B	3	line	Premature deaths (by ozone and fine suspended particles)
MB_3006	35C	3	line	Emission CO <sub>2</sub>
MB_3009	35D	3	line	Emission hydrocarbons
MB_4002	36A	3	line	Emission carcinogenic compounds
MB_3025	36B	3	line	Emission particles
MB_4001	36C	3	line	Emission acidifying compounds
MB_3086	36D	3	line	Emission factors road traffic
MB_3046	37A	3	line	Emissions road traffic (CO <sub>2</sub> , NO <sub>x</sub> , hydrocarbons, particles)
MB_4043	37B	3	bar	Comparison of emissions SO <sub>2</sub> of target groups
MB_4040	37C	3	bar	Comparison of emissions NO <sub>x</sub> of target groups
MB_4041	37D	3	bar	Comparison of emissions CO <sub>2</sub> of target groups
MB_4042	38A	3	bar	Comparison of emissions hydrocarbons of target groups
MCB_5051	38B	3	line	Acidic deposition
	39	3	line	Emission hydrocarbons
	40	3	line	Emission acidifying compounds (refineries)
	41A	3	line	Emission heavy metals
	41B	3	line	Emission dioxins
MB_3003	44A	4	line	Complaints about noise
MB_4034	44B	4	map	Noise, complaints per municipality (Rotterdam Airport)
MB_4035	44C	4	map	Noise, complaints per municipality (excluding Rotterdam Airport)
MB_4030	44D	4	line	Nuisance by noise
MB_3035	45A	4	map	Acoustic load by industry
MB_4044	45B	4	line	Acoustic measure points industry
MB_4032	45C	4	map	Environmentally protected area's (noise)
MB_4047	45D	4	map	Industrial noise in environmentally protected area's
MB_4048	46A	4	map	Traffic noise in environmentally protected area's
MB_3004	46B	4	line	Noise abatement measures to be implemented
MB_4019	46C	4	line	Permitted higher noise levels houses (sources)
MB_4023	46D	4	line	Permitted higher noise levels houses (noise levels)
MCB_5061	48A	5	bar	Cleanup of underground tanks (companies)
MCB_5048	48B	5	bar	Soil cleanup of industrial sites (agreements)
MCB_5063	48C	5	bar	Soil cleanup of industrial sites (soil investigations)
MCB_5046	48D	5	bar	Cleanup of new contaminated soil
MCB_5058	49A	5	bar	Soil protection act
MCB_5049	49B	5	bar	Soil cleanup former gas work sites
MCB_5050	49C	5	bar	Soil cleanup former petrol stations
MCB_5060	49D	5	pie	Use of soil cleanup possibilities

MCB_5041	50A	5	pie	Destination of contaminated soil
MG_8004	50B	5	map	Availability of soil quality map
MI_9002	55A	6	line	Index quality national waters
MI_9007	55B	6	line	Eutrophication of surface waters
MI_9008	55C	6	line	Heavy metals in surface waters
MA_1039	55D	6	line	Heavy metals in sludge, national waters
MA_1040	56A	6	line	Organic micro pollutants in sludge, national waters
MA_1041	56B	6	bar	Ecological quality large inland waters
MA_1045	56C	6	bar	Herbicides in surface waters
MA_1028	56D	6	line	Quality in relation to function inland waters
MA_1025	57A	6	bar	Intake stops Meuse water (drinking water production)
MB_4013	57B	6	bar	Complaints inland waters
MB_4046	57C	6	pie	Complaints inland waters
MA_1030	57D	6	line	Discharges heavy metals by major industries
MA_1032	58A	6	line	Discharges benzene and chlorides
MA_1007	58B	6	line	Discharges oil
MA_1004	58C	6	line	Discharges phosphate and nitrogen
MCB_5053	58D	6	bar	Discharge of eutrophication substances by agriculture and horticulture
MA_2020	59A	6	line	Use of groundwater (total)
MB_1046	59B	6	line	Use of groundwater by major industries
MG_8018	59C	6	map	Municipal Water Plan per municipality
MG_8017	59D	6	map	Municipal Sewerage Plan per municipality
MG_8014	60A	6	map	Buildings without sewerage per municipality
MA_2021	60B	6	map	Buildings without water meter per municipality
MC_5014	60C	6	line	Quality and quantity of sludge
	61A	6	line	Copper in surface waters, national waters
	61B	6	line	Zinc in surface waters, national waters
	61C	6	line	Copper in sludge, national waters
	61D	6	line	Zinc in sludge, national waters
	62A	6	line	Copper in water soil
	62B	6	line	Zinc in water soil
	63A	6	line	Discharges heavy metals, copper and zinc
MI_9015	66A	7	line	Index nature quality
MCB_5055	66B	7	line	Number of butterflies
MA_1049	66C	7	bar	Number of seals
MA_1050	66D	7	bar	Number of common terns

MA_1052	67A	7	bar	Number of redshanks
MA_1051	67B	7	bar	Number of water birds
MB_3030	67C	7	line	Number of summer birds
MB_4026	67D	7	line	Number of sand lizards
MG_8029	68A	7	bar	Number of bats
MB_4045	68B	7	bar	Qualifying species Haringvliet
MB_4039	68C	7	line	Satisfaction urban green
MB_3031	68D	7	bar	Urban green in Rotterdam
MG_8023	69A	7	map	Ecological structure
MB_3016	69B	7	line	Ecological bottlenecks
MC_5037	69C	7	bar	Nature reserves
	70	7	line	Number of summer birds
MB_4038	73A	8	line	Domestic waste collection (client participation)
MB_4037	73B	8	line	Domestic waste collection (client satisfaction)
MG_8019	73C	8	map	Municipal Waste Plan per municipality
MG_8020	73D	8	map	Municipal waste analyses per municipality
MC_5010	74A	8	bar	Domestic waste
MC_5004	74B	8	line	Separated collected domestic waste
MCA_6006	74C	8	map	Separate waste collection per municipality (paper)
MCA_6007	74D	8	map	Separate waste collection per municipality (organic)
MCA_6008	75A	8	map	Separate waste collection per municipality (glass)
MCA_6009	75B	8	map	Separate waste collection per municipality (textile)
MCA_6010	75C	8	map	Separate waste collection per municipality (small chemicals)
MCA_6011	75D	8	map	Separate waste collection per municipality (separated)
MC_5027	76A	8	line	Ships' waste inland shipping (deliveries)
MC_5028	76B	8	line	Ships' waste sea shipping (deliveries)
MC_5042	76C	8	line	Ships' waste inland shipping (quantities)
MC_5043	76D	8	line	Ships' waste sea shipping (quantities)
	77	8	bar	Separate waste collection (paper)
MD_7081B	81A	9	line	Electricity use consumers
MD_7081A	81B	9	line	Natural gas use consumers
MD_7092	81C	9	bar	Use of green power (households)
MD_8022	81D	9	bar	Energy Achievement Advice
MD_7082	82A	9	line	CO <sub>2</sub> -reduction through energy saving
MD_7083	82B	9	bar	CO <sub>2</sub> -reduction through sustainable energy
MG_8021	82C	9	map	Wind energy (placing)
MG_8028	82D	9	line	Wind energy (production)
MG_8012	83	9	map	Use of green power per municipality

MD_7031	87A	10	bar	Implementation internal environmental care in industries
MG_8015	87B	10	map	Municipal Environmental Policy Plan per municipality
MD_7079	87C	10	map	Implementation internal environmental care per municipality
MG_8013	87D	10	bar	Education of nature and environment in Rotterdam
MD_7104	91A	11	bar	Safety system
MD_7106	91B	11	bar	REOV
MB_4031	91C	11	line	Experienced safety
MD_7105	91D	11	pie	Company categories licensed under the Environmental Management Act
MD_7102	92A	11	line	Licenses municipal industries
MD_7103	92B	11	line	Licenses provincial industries
MD_7080	92C	11	bar	Effective level of measures (major industries)
MD_7024	92D	11	line	Enforcement municipal industries
MD_7072	93A	11	line	Enforcement refineries
MD_7075	93B	11	line	Enforcement process industry
MD_7073	93C	11	line	Enforcement storage and transshipment
MD_7091	93D	11	line	Enforcement power plants
MD_7090	94A	11	line	Enforcement waste processing plants
MD_7086	94B	11	line	Enforcement cattle farms
MD_7087	94C	11	line	Enforcement cultivation under glass
MD_7094	94D	11	bar	Enforcement by police
INWON_04	97	BY1	map	Municipality borders and number of inhabitants