

The environment in the Rotterdam region 2002

This appendix contains the English translation of the introductory paragraphs of chapters 2-4 and the complete chapters 5 and 6 of the report called "HET MILIEU IN DE REGIO ROTTERDAM 2002". We have also included a translation of the graph titles. The report is a result of a co-operation of regional environmental authorities. This co-operation is called "Milieumonitoring Stadsregio Rotterdam (MSR)".

On pages 13-16 of the report you will find the English summary, describing the main conclusions. 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.

Background

In the Rijnmond area living, working and recreation are accommodated within a relatively small surface area. On less than 800 km² approximately 1.2 million people live in 18 municipalities. This limited space contains both urban and rural elements.

The transportation of goods and people which these activities necessitate, particularly by road, have a great impact on the environment and the land use in the region. Because of the presence of the world's largest port, large industries and approximately 22,000 medium and small companies with an environmental license, the region is considered the economic driving force of The Netherlands. Many chemical and petrochemical plants, power plants and storage and transshipment companies are located here. Horticulture areas have been designated and areas have been reserved for nature and recreation.

The concentration of so many functions in the region requires the use of effective environmental legislation in order to prevent economic growth from harming the (living) environment. Legislation in itself is not enough. Co-operation between these parties should lead to a shared responsibility for, and backing of, the environmental policy in the years to come.

As each governmental agency in the Rijnmond area has its own authority and responsibilities, co-ordination is a pre-requisite. The continual developments within the "environmental field" itself also play an important role. Concepts such as 'sustainability' and 'area-oriented approach' have gained a firm hold within environmental policy. The accent within environmental policy shifts from a sector - to an integral approach and from centralised to decentralised management. This requires co-operation on different levels: between governments, but also between citizens, companies and government agencies.

Due to these changes and the diverse tasks of the regional authorities, many different policy targets and standards are used. Unfortunately some policy targets have yet to be quantified. The co-operation between governmental agencies within the region is positive. However, authorities publish their findings, endeavours and results separately, and as these reports cover different geographical areas the results are often dispersed and difficult to compare, making a total view of the region difficult.

MSR and objectives of monitoring

In 1994 eighteen governmental agencies, the police and the energy distributing company formed a co-operation under the name of Environmental Monitoring Rotterdam Region (Dutch abbreviation MSR).

In the report indicators are presented, for which policy targets or standards have been formulated. Some indicators, with no concrete targets, are included for their signalling function. Each indicator usually consists of a numerical depiction of the status or the development of environmental aspects, together with their policy targets or standards. In most cases we report on the previous ten years. This gives the administrators and civil servants, as well as target groups (industry and consumers), pressure groups and civilians the information they require on the state of the environment in the Rotterdam region.

Working groups have named indicators that depict the status or the development of a great number of environmental aspects. The large amount of data has been condensed through selection and aggregation. In some cases multiple indicators could be aggregated to indexes. The origin of all data can be traced through a systematic registration and this monitoring system is the source of the yearly report.

The first MSR report was issued in 1994, this being the eighth edition. In this eighth report we monitor environmental policy in the Rijnmond area, in order to follow the execution of environmental policy and, if necessary, adapt it. Monitoring of environmental policy in this context means comparing a situation with policy targets and standards. Several local, provincial and national policy documents are relevant in this respect.

Contents

The subjects in this report have been grouped in accordance with the internationally used pressure-state-response model, depicting information on sources, environmental quality and efforts made by governments and target groups. A graph and a short explanation depict each indicator.

If possible, the information is presented in the form of an index (red frames), giving the general situation for a theme. The underlying indicators are then presented separately (green frames).

Chapters 2, 3 and 4 give a fairly complete impression of environmental issues in the Rotterdam region. In principle, the development over a number of years is presented, together with the policy target. From this it can be determined whether or not policy or execution of policy is on course.

We start in chapter 2 with the environmental quality because policy is aimed at reaching a certain quality of the environment. Chapter 3 deals with the sources of environmental pollution or disturbance. Governments and so-called target groups for environmental policy, such as industries and consumers, conduct their own activities aimed at improving the environment. Many of these efforts are described in chapter 4.

Chapter 5 is dedicated to the special themes 'Manoeuvring towards tailor-made enforcement', 'Asbestos: present state of affairs' and 'Air pollution along arterial roads'. Chapter 6 deals with possible developments in the (near) future.

The annexes contain a comparison of the numbers of complaints about odours and noise from different municipalities and the districts of Rotterdam. Also a list of abbreviations and a key word register are included.

This chapter shows the trend in the quality of the environment in the Rotterdam region. We describe the trends over the previous years for the quality of water and underwater soil, the air, the residential areas and nature.

Water and underwater soil

Water

In the Rotterdam region four authorities measure the quality of the waters. The National Water Authority is responsible for the national waters, roughly speaking the waters that have an open connection to the sea. The inland waters have their own authorities.

The quality of the national waters and the inland waters is depicted by two indexes, consisting of a number of characteristic indicators. For each indicator, each year the distance (as a percentage) to the target is calculated and the average of these distances determines the index for that year.

The eco-toxicological level of protection for aquatic organisms from exposure to concentrations of toxic substances as an index for the overall quality of *national waters* is presented in this report. The North boundary and the South boundary are presented separately because they are different water systems. This eco-toxicological level of protection is expressed as the percentage of aquatic organisms that, given the occurring concentrations, will experience no effect from these substances. In recent years, the assessment of environmental quality has focused on the determination of risks from pollution, usually differentiating between risks for humans, risks for ecosystems and dispersion risks. This risk approach has led to the development of standards for eco-toxicological risks, in which the protection of species is the main objective. The conservation of species and of ecological functions is the starting point. Each toxic substance has been assigned a maximum permissible risk (MTR), protecting 95% of the species potentially present in an ecosystem. Also a level of negligible risk (VR) is determined for each substance, protecting 100% of the species potentially present in an ecosystem. Toxic substances are metals and organic micro-pollutants.

Since 1992, both the North boundary and the South boundary show an increase in the percentage of organisms that is protected. The quality of the North boundary has improved over recent years and is now equal to the South boundary.

The aim for 2000, in which 95% of the species is protected, has not been reached because the level of copper remains too high.

The index for the *inland waters* is based on the average ecological quality, to be reached in 2006. The average ecological quality of the inland waters is based on the concentration levels of organic substances and oxygen and the growth of alga. The water quality does not yet meet the targets, despite a rise in the average quality. However, it may suffice in certain locations.

The average ecological quality throughout the Rijnmond region has continued to improve since the sharp increase in 2000. At present, 55% of the large inland waters meet the desired quality requirements. As in previous reports the quality of the inland waters has been compared to the goals set for specific functions. Only 14% of the fishing waters were of sufficient quality in 2001. For agricultural, swimming and recreation waters approximately 80% met the goals set for these types of water.

Air

In most of the graphs the air quality *standard* (grenswaarde) for the substance in question is indicated. This is the maximum concentration allowed at this time. Sometimes a *long-term target* (streefwaarde) has been formulated. The *intermediate target* (richtwaarde) is the future policy target.

Air quality in Rijnmond is measured, mostly by DCMR, at a large number of measuring stations. As a measure for the (general) air quality we have calculated an index by aggregating the data from the most relevant indicators. The index shows that the air quality has improved during the last decade, but this improvement has come to a standstill in recent years.

In 2001 new goals for 2010 were formulated for some substances. These goals are less ambitious than we had assumed they would be. As a consequence, the index has risen in comparison to previous reports. This chapter shows the concentrations at the measuring stations. Along arterial roads the concentrations of NO₂ and fine particulate will be above the quality standard (see paragraph 5.3).

Residential areas

Primarily, the number of complaints originating from residential areas expresses the quality of the living environment.

The complaints are an indication of the nuisance people suffer and are therefore a negative measure for the quality of residential areas. Many institutes receive complaints: the water control boards for the inland waters, the Directorate General for Public Works and Water Management, the police, Municipal Health Services and DCMR. In this report, complaints registered by Municipal Health Services, DCMR and the police have been presented.

The number of complaints received by the “incident room” of DCMR rose in 2001 by 4,743 (29%) to 21,073. Most complaints are still caused by air traffic. The catering industry causes fewer complaints than air traffic but more than the industry.

The number of complaints, concerning both air traffic and odour nuisance caused by industry, has risen (52% and 15%). The rise in the number of stench complaints is completely due to the Atofina incident in November 2001.

In 2001 a survey was carried out to ascertain how the inhabitants of the Rijnmond region experience the environment. The results are surprising, as they appear to show a significant decrease in the number of people who experience serious disturbance from noise, particulate or odour from industry compared to the results of a similar survey carried out in 1998. There has also been a decline in the nuisance caused by road traffic. The decline in nuisance is also represented in the average mark respondents appointed for general environmental quality, but the differences between the marks given in 1998 are less pronounced.

Nature

This year, for the first time, the quality of nature is indicated by an index. This index is based on those observed animal species, for which separate indicators are presented in this report. The index shows that prior to 1995, the quality continued to improve. After 1995 the observed populations per species stabilised on average.

As an indicator for water quality of the delta area, we show the population of seals and of a number of bird species. Due to the presence of large populations of the common tern and gadwall, the Voordelta and the Nieuwe Waterweg have been designated Wetlands of International Importance.

As an indicator for the natural value of urban areas, agricultural areas, dry natural areas and wetlands, a characteristic species for each area type has been selected. The populations of the observed species give a variable impression. The number of reed warblers and willow warblers is increasing rapidly and the number of blackbirds and lapwings has barely increased against 1984 levels.

The Rijnmond area is renowned for its port, with heavy industries, such as refineries, chemical plants and storage and transshipment companies. The port attracts a lot of traffic; mainly road traffic and shipping. These sources are the most important target groups for (regional) environmental policy, because they are the major polluters. Other pollution sources are air traffic, consumers and agriculture. There is no emission data about air traffic in this chapter. However, in paragraph 2.3 the number of complaints due to air traffic is presented. A separate section (3.6) is dedicated to the relationship between environment and economy for five target groups.

Major industries

The emission to the air of acidifying substances has reached a standstill in 2001 at a level comparable to that of 2000. This marks an end to the downward trend and means that the target for 2000 still remains just out of reach.

The target for 2000 for the PAH emissions was not yet reached in 1999, though all major industries comply with the emission standards and have an adequate license. The small industries present an even worse picture: the emission of PAHs increased strongly in 1999 compared to 1998.

A concentrated effort is required in order to meet the target for 2010. The same applies for emissions of particulate and CO₂.

On the positive side, in the year 2000 nearly all discharges have met the targets for both 2000 and 2010.

A new indicator this year is one showing the use of groundwater by the major industries. The major industries use the groundwater mainly for cooling purposes.

Groundwater is also used in the agricultural sector and for soil(water) clean-up operations. These amounts are minimal compared to those used by the large industries.

Road traffic

In this paragraph, we also deal with the number of car kilometres driven (MB_3028) and the emission factors per car (MB_3086). In the 2001 report, these indicators were presented in chapter 4. Due to the direct relationship with the other traffic indicators, these indicators have now been placed in this chapter.

According to the Regional Traffic and Transport Plan the number of car kilometres driven should decrease to 115% of the 1996 level in the year 2010. In the next report an indication will be given as to whether the target for 2010 is likely to be reached.

Despite the ongoing increase in car kilometres, total emission of hydrocarbons, fine particles and NO_x per car has fallen sharply, thanks to cleaner engines. CO₂ emissions have risen because this emission factor hardly decreased.

Households

The members of the 500,000 households in our region also exert considerable pressure on the environment. They drive a large number of car kilometres (see 'road traffic'), produce waste and use electricity and gas.

The total amount of waste produced per household was higher in 2001 following a small decline in 2000. Most of the waste is unseparated waste. The upward trend that started in 1997 has continued. More information about waste can be found in paragraph 4.6.

The use of electricity per household increased in the year 2001, as in previous years, despite the fact that household appliances have become more energy-efficient. A positive development is the spectacular increase in the number of buyers of so called green power (see MD_7092 in paragraph 4.2). Contrary to the increase in the use of electricity, the use of gas, if corrected for the temperature influence, continues to decrease.

Agriculture

In this chapter only the CO₂ emissions to the air and the discharges of phosphorus and nitrogen to the surface waters are addressed. In both cases little progress has been made. Phosphorus and nitrogen discharges have returned to 1995 levels.

Comparing target groups

The relative contribution of seven target groups to the emission of four important air-pollutants differs little in 1999 as compared to the previous year. The pollutants concerned are CO₂, hydrocarbons, NO_x and SO₂. The total emission also remained virtually unchanged. The emission of PAHs by small industries however rose sharply from 6,312 tons to 15,801 tons in 1999. This also explains the increase in the total emission of PAHs.

Acid precipitation can only partially be influenced in the Rijnmond area, as the sources of acidifying substances can originate from elsewhere, even from outside the Netherlands. The targets for 2000 have not been met, despite the fall compared to 1999.

Environment and economy

Environmental policy is aimed at detaching economic growth and environmental pressure. This is the case when economic growth is combined with decreasing environmental pressure (*complete detachment*) or when economic growth is more rapid than the increase of environmental pressure (*relative detachment*).

This year, as in previous years, we have determined the measure of detachment for five target groups: refineries, chemical industry, storage and transshipment, power plants and road traffic. These target groups cause an estimated 80% of the environmental pressure in the region.

For each target group we show the environmental pressure, the economic development and the *environmental intensity (MI)*. The environmental intensity is a measure for the detachment: the further the environmental intensity lies below 100, the higher the detachment is. With the intensity above 100, there is combined growth of economic activity and environmental pressure. You can find the results in paragraph 3.6 of the MSR2002 report.

This chapter gives an overview of the effort made by citizens, companies and governments towards improving the environment. The effort made on a voluntary basis is dealt with in the paragraph 'self regulation'. Following the results of the endeavour applied in the field of energy, efforts in the field of licensing and enforcement are presented. More background information about enforcement can be found in chapter 5. We also describe the results of the effort applied in the field of nature and the abatement measures aimed at traffic noise, soil and water quality. In the last paragraph waste produced by households, ships and industries is described.

Self-regulation and covenants

Households

Strengthening the involvement of civilians and non-governmental organisations can lead to the desired environmental conduct. The increasing number of EcoTeams illustrates a rise in the involvement of civilians. In the region 904 households are, or have been, active in the EcoTeam program.

Companies

STIMULAR gave advice to many companies' regarding prevention and re-use of waste. As the STIMULAR project has finished it will not be presented in this report. This also applies to the Dutch emission and KWS2000 guidelines, as all installations comply, as of 2000, with these guidelines. At this moment new policy is being developed in order to continue emission reduction. The Dutch emission guidelines will probably be updated in 2002. More information about the emissions of PAHs can be found in paragraph 3.5.

At the beginning of 1998 the project MZRR started. This project offers independent advice on environmental and energy matters to companies. MZRR can also provide aftercare for up to six months following their initial advisory report.

As all contracts with the municipalities ended at the end of 2001, thought is now being given as to how the MZRR project can be continued in 2002.

Governments

An internal system for environmental care has been mandatory for all municipalities since 1998. In 2001, this has still not been realised. All municipalities have developed a Municipal Environmental Policy Plan or are in the process of doing so.

In 1997 the Ministry of Transport, Public Works and Water Management signed a covenant on durable safety with the Dutch municipalities, provinces and the authorities for the quality of waters. The development of 30 km/hr and 60 km/hr zones are concrete measures being taken to protect the living environment. The Ministry has reserved money to stimulate this development. The environmental advantage is that traffic noise will be reduced. In 30 km/hr zones the maximum noise levels on houses are by definition below the required levels.

Efforts toward energy

Municipalities used less green energy in 2001 compared to 2000. The number of municipalities that use green energy has also dropped from four in 2000 to three in 2001. Only Spijkensisse, Vlaardingen and Capelle aan den IJssel use green energy at present. Households set a good example to others where local governments fail. Green energy now supplies more than 11% of the total energy consumption to households.

Licences and inspection

In this paragraph compliance with the Environmental Management Act and/or the Pollution of Surface Waters Act is treated for seven company sectors. The number of preventive checks is related to the number of initial warnings. This gives a global picture of the compliance with the laws for these sectors. Furthermore we report the number of incidents in these sectors.

In chapter 5 we describe how compliance with the laws can be better indicated. The present indicators do have some weaknesses. For example no distinction is made between the severity of the offence or the fact that one initial warning can address more than one offence.

The endeavour of the regional environmental police force is shown in a new indicator concerning the number of small charges made by the police.

Efforts towards nature

Compared to 1993, the acreage of urban green in Rotterdam has increased by 4%. Relatively more urban green is maintained intensively. De acreage of naturally maintained urban green continues to increase slowly.

Abatement measures

Noise

Between 1993 and 2001, measures aimed at reducing road traffic noise were taken for more than 2,400 houses.

Measures to reduce rail traffic noise were taken for approximately 200 houses. Major efforts remain essential in order to reduce the number of houses exposed to road and rail traffic noise to zero.

Soil

All municipalities in the Netherlands are required to have an overview of the soil quality within their boundaries by the year 2005. This means that they must develop a soil quality map or a soil information system. In Rijnmond nine out of eighteen municipalities have a soil quality map and seven others a soil information system. Only one municipality, Bleiswijk, has developed neither of these tools. In its financial estimates the Ministry of Housing, Spatial Planning and the Environment makes a distinction between the periods before and after 2005. Besides these and other financial incentives, there is also another reason for municipalities to have an overview of soil quality. If a municipality has an overview it is easier to reallocate soil and assess building plans.

In this paragraph one can also find data about soil clean-up regarding:

- * Cleanup of newly contaminated soil
- * Use of soil cleanup possibilities
- * Soil cleanup of industrial sites
- * Soil cleanup of former gas work sites and petrol stations
- * Cleanup of underground tanks

Water

Water is contaminated by diffuse sources like nutrient wash out from agricultural land and roads and by point sources. In this report we highlight two kinds of point sources: buildings without sewerage and stormwater overflow points. These points can be divided into points that may or may not cause hazard to animal or human health. In the Rijnmond area there is a total of nineteen hazardous stormwater overflows. The municipalities have to take responsibility and pay the costs for the construction and maintenance of these overflow points, but the sanitation itself takes place in close harmony with the water control boards.

The number of spills due to activities of inland and sea shipping decreased in 2001. In the port of Rotterdam 316 spills were registered compared to 398 in the previous year. The spills were estimated at a total of 48 m³. To improve the damming of contamination a co-operation of different organisations has been founded.

Waste disposal

Households

In the MSR2003-report we can present the analyses of the collected unseparated waste in Rotterdam. Together with analyses of other municipalities a good image can be given of the composition of household waste. At present Rotterdam, Schiedam and Vlaardingen appear to stand out poorly regarding separate waste collection.

Companies

The regional agricultural organisation (WLTO) collected 204 tons of littering materials containing asbestos from 324 agrarians in the Rijnmond area in 1998. In 2001 a pilot was started in the province of Noord-Holland to collect asbestos contained in buildings. Depending on the co-operation of the Ministry of Housing, Spatial Planning and the Environment and the municipalities a similar project can start in the Rijnmond area too.

The amount of waste produced by major industries in 2000 has been halved compared to 1999 due to the closing of the two factories that produce artificial fertiliser, Kemira Agro and Hydro Agri. If we take the waste of these two factories into account the waste quantity dropped by 150 tons (25%).

5.1 Manoeuvring towards tailor-made enforcement

Introduction

The political spotlight is currently focused on enforcement. As an instrument, enforcement is deployed to improve compliance with environmental legislation. This is done to ensure safety and livability in the Rijnmond area, but enforcement, as an instrument cannot guarantee these values by itself.

In this summary, we first position enforcement as a part of the policy chain and demarcate the playing field for enforcement within the Rijnmond region. We then determine the range of enforcement as an instrument. Finally, we examine the effects of enforcement in the Rijnmond region, zooming in on the indicator: “compliance behaviour”: is it possible to improve insight into enforcement efforts with this indicator?

Together with the MSR2002 document a background document has been produced on enforcement, describing in more detail the variety of enforcing government bodies, environmental legislation to be enforced and indicators of enforcement presently available. This summary is based on the background document.

5.1.1 enforcement as part of the policy chain

Environmental policy is developed to protect the quality of the living environment. Environmental problems are dealt with by issuing laws and regulations, both on a national and international scale.

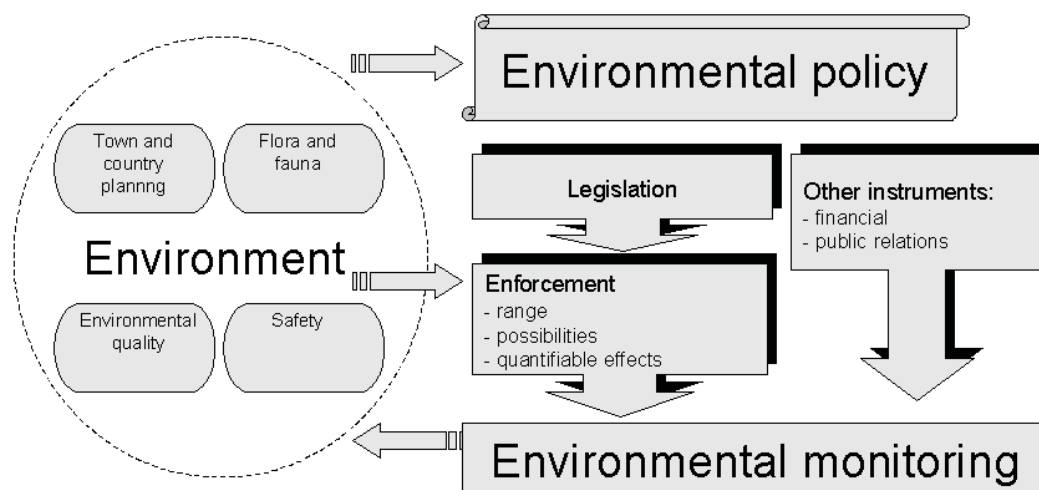
However, this does not guarantee that those who are addressed by these regulations are in fact acquainted with them. Although it is constitutionally laid down that all should know the law, it is wise and fair to inform companies and civilians about new laws to be issued. Even if we assume that everyone knows about new rules, this does not mean these new rules will be complied with. We all know that the maximum speed limit is violated regularly. The same applies for illegal parking.

This is why enforcement of legislation is necessary. Figure 1 shows the position of enforcement in the policy chain.

The state of the environment on a global scale and in the Netherlands is constantly monitored, focusing on the main problems. To deal with these problems, legislation is issued. As the legislation deals with the more serious environmental problems, it follows that all legislation should be fully complied with. In an ideal situation enforcement should be practised in such a way that all legislation is complied with. In reality, this is impossible.

Enforcement contributes to solving environmental problems indirectly by correcting violations of the standards. This can only be done properly if we realise the (im)possibilities of enforcement as an instrument. In other words: what is the range of enforcement? Only then, we can set concrete, realistic and measurable targets for enforcement. The quality of legislation determines the range of enforcement. Different laws, for instance the Environmental Management Act and the Law on spatial planning, should be well co-ordinated.

Figure 1: The position of enforcement in the policy chain.



Zoning plans and environmental permits should be complementary; otherwise, proper enforcement will not be possible. Unfortunately, this is not always the case.

In order to execute enforcement effectively, good insight into the effects of enforcement activities is needed. Enforcement activities are aimed at better compliance behaviour of target groups. Quantifying the effect of enforcement can provide insight into the effectiveness of enforcement for inhabitants and administrators. This is a task for the enforcing bodies active in the region. However, up until now efforts to do this have proved unsuccessful.

Examining the (im)possibilities of enforcement will eventually lead to better results: more safety and livability. It will also lead to more insight into these results: the contribution of enforcement to more safety and livability. Figure 2 represents this in diagram form.

First we deal with the range of enforcement by describing the limitations and the opportunities and possibilities of this instrument. We then go on to describe how the effects of enforcement in the Rijnmond region can be monitored in a more accurate way than in present-day practise.

5.1.2 Enforcement range

Governmental bodies trying to accomplish better compliance behaviour with environmental legislation by means of enforcement, should consider the various limitations of the instrument. We first describe three "external" limitations. We then deal with the limitations of the instrument itself.

External limitations

Legislation is dependant on the legislative frame

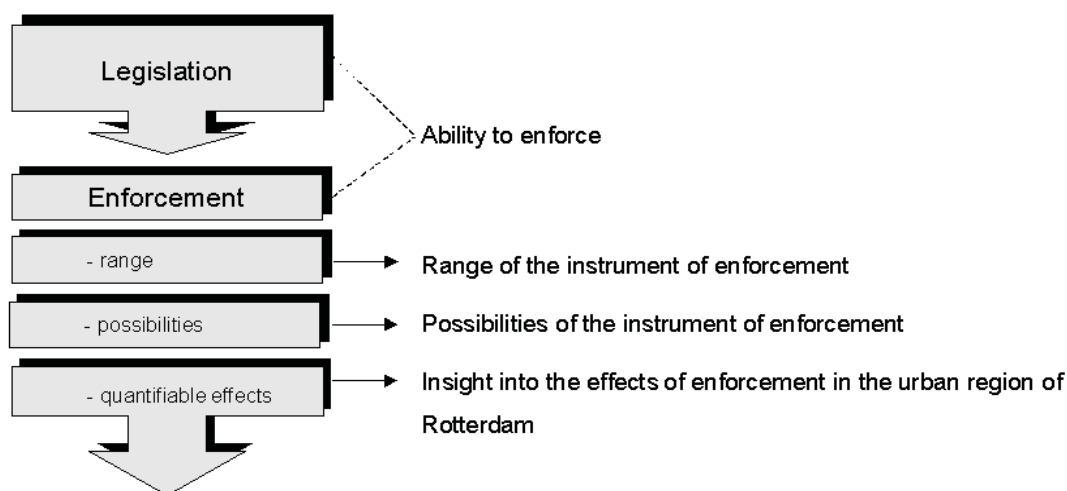
The range of enforcement is limited because the instrument is part of a policy chain. This chain starts with identifying an environmental problem; the problem is then translated into appropriate standards or legislation. Enforcement is only an issue after the standards have been set. Enforcing bodies can only give the legislative force an indication regarding the feasibility of effective enforcement of the standards to be met.

Poor quality of legislation

Poor quality of legislation can have three causes:

1. the regulations are too complex, unclear or leave too much room for (miss)interpretation;
2. the legislator provides little guidance in implementing the new regulations, for example by not informing the target groups. The likelihood that target groups comply with the new rules "spontaneously" is therefore is very small. Precisely the likelihood of spontaneous compliance is decisive in whether or not new legislation will achieve the desired effects, as enforcement alone can never achieve full compliance.
3. finally, complexity of new regulations causes enforcing authorities to feel hesitant about enforcing them, due to the risk of legal faults. Wrong application of the law can have major legal consequences. If this situation occurs, new legislation will not be enforced, en in fact we can speak of a situation of "passive tolerance". To prevent this, enforcing bodies should report legislation of poor quality to the administrator, who can in his turn send the law back to the legislator.

Figure 2: Insight into the (im)possibilities of enforcement.



It is not only the poor quality of legislation en regulations that poses a problem to enforcing bodies. Also the great number of guidelines is a problem. Each guideline has to be interpreted for use by single companies, for example by translating the guideline into a permit. This is very time consuming, as new guidelines are constantly being issued.

Enforcement is one of many policy instruments

Using enforcement as an instrument for reaching compliance, is only one option, and not always the best. Environmentally friendly behaviour of households and companies can also be reached via effective public relation campaigns, or by financial stimulation.

Internal limitations of enforcement

Enforcement is an instrument with a number of limitations:

1. national policy on enforcement is regarded as being too reactive;
2. authorities dealing with enforcement lack decisiveness
3. the playing field and strategy of enforcement lacks transparency;
4. inspections cannot ensure that all violations are detected. An inspection takes place at one point in time. Moreover, companies quickly learn how to profit from incomplete legislation;
5. more inspections do not necessarily lead to a proportional additional effect;
6. financial means and manpower available for enforcement are limited: therefore it is impossible to inspect on all environmental legislation.

Even with unlimited financial means or manpower and very intensive inspection, compliance with all environmental rules could not reach a full hundred percent. Theoretically speaking, this would be feasible for rules on physical elements within a company (installations, buildings, storage capacity, etc.), but total compliance with rules on behaviour will never be reached. People do make mistakes; there will always be moments when the rules are violated.

Administrators should be aware of the fact that non-compliance is an everyday fact of life. Research on compliance with the Environmental Management Act in Rotterdam shows that 60% of the companies do not comply with all the rules. When we take into account that every year no more than 25% of the companies is inspected, it becomes clear that regulations are more often violated than complied with.

As the financial means prevent us from enforcing all the rules, we prefer enforcing bodies to deal with those violations of environmental regulations that cause the most serious environmental damage. What environmental problems then should we devote our attention to, and in what way could enforcement play a role in this? In order to answer this question, administrators should determine which environmental and safety related problems they consider the most important. Enforcing bodies could then concentrate on those problems.

See figure 3.

As more inspections do not result in proportionally better compliance behaviour, we should employ the instrument of enforcement selectively. The growing call for more inspections should therefore be regarded with an appropriate nuance.

5.1.3 possibilities of enforcement

In order to make the right choices as to where and how to use the instrument of enforcement, and to explain these choices to the public, it is necessary to answer five questions:

1. what environmental problems do we consider most important?
2. is enforcement the right instrument?
3. what companies should we focus on?
4. what form of enforcement gives the best result?
5. what is the effect resulting from enforcement?

Figure 3: More inspections do not result in proportionally better compliance behaviour.

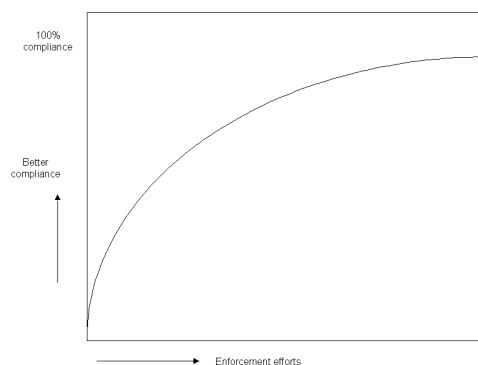
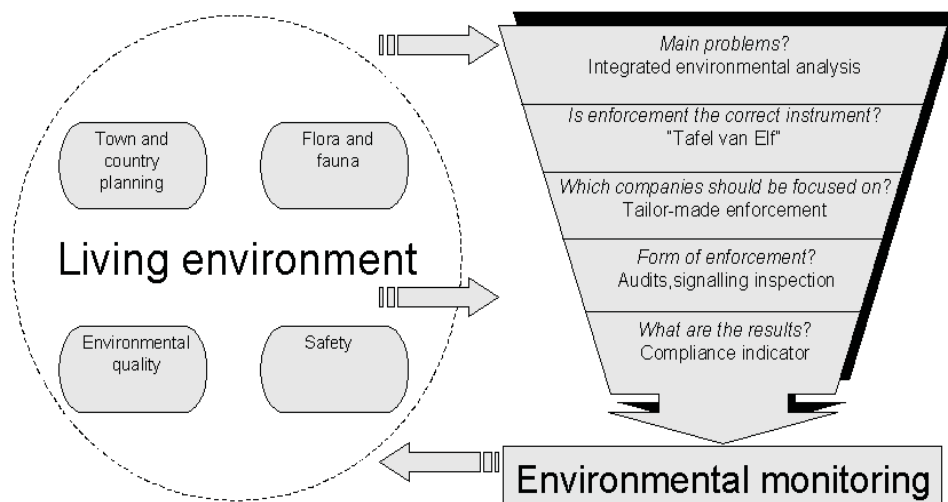


Figure 4: Funnel system for making enforcement choices.



To answer these questions, several instruments have been developed, both to prioritise enforcement activities and to carry them out more effectively and efficiently:

- * an Integrated Environmental Analysis was carried out by all enforcing bodies active in the Rijnmond area, in order to select the main environmental problems of the region;
- * a “Tailor-made enforcement” system has been developed, in order to determine the amount of enforcement attention a company requires as related to its environmental performance.

In the Netherlands, up to now, there is hardly any insight into the effects of enforcement. It is important to answer this last question in order to develop a well-founded enforcement policy and to make clear why enforcement is necessary.

Monitoring Stadsregio Rotterdam therefore wants to monitor the effects of enforcement by means of an indicator on compliance.

5.1.4 Monitoring the effects of enforcement in Rijnmond

As we described in the previous paragraphs, there are quite a few inherent limitations of enforcement. Nevertheless, the instrument can be improved; more specifically the management of enforcement can be made more translucent, by showing the effects of enforcement activities. The enforcing bodies active in the Rijnmond region wish to improve monitoring of enforcement.

For this reason, studies have taken place to explore the possibilities of developing an indicator of compliance behaviour.

Monitoring the results of enforcement is a necessity

It proves difficult to quantify the direct results of enforcement activities. Enforcement aims at better compliance behaviour of companies, presupposing this will lead to a reduction in environmental pressure. However, it is by no means certain that more compliance will in fact lead to less pollution. The reason for this is that enforcement activities have a preventive effect. It is tricky to estimate the effect in terms of avoided pollution.

Nevertheless it is important to monitor the results of enforcement activities. If we fail to do this, we will lack comprehension of the aimed-for relationships between the different elements making up the policy chain. Administrations need this kind of information in order to make well-founded decisions and to agree with enforcers on the frequency and target groups of enforcement activities. As every inspection costs money, it is important to strive for efficiency.

Markers for working with an indicator of compliance behaviour

In order to measure compliance of a branch as a whole, it is necessary to develop an indicator that can represent compliance of all member companies of that branch. This may mean that different regulations applying to different companies will have to be aggregated into one score.

As it is impossible to compare all regulations (there are simply too many), we will have to determine which are the principal ones. Compliance with different rules will then have to be expressed in comparable terms.

For example, let us suppose there are ten gas stations in Rijnmond, five of which do not comply with all safety regulations. Two of which only offended because they did not register. If we do not take into account minor offences the compliance rate would be of 70%; if we do the rate would be only 50%.

This example serves to illustrate that developing an indicator “compliance behaviour” is not an easy task. Should all rules weigh as being equally important? After all, the standard was set because it was considered necessary; therefore, enforcers should not question its importance. The importance of compliance of different branches also differs in terms of environmental effects. Further more, the degree in which standards are exceeded or rules are violated is important and should perhaps also be considered. Finally, an indicator of compliance has limited representation value: an inspector cannot check on all the rules when visiting a company, and cannot discover all violations. Inspection on rules of conduct can only give a random indication.

In order to determine the compliance rate the following choices will have to be made:

Environmental permit/ General Administrative Order

condition 1 - what are the core conditions?

condition 2 - conditions to inspect/not to inspect?

... % compliance

condition 3 - how to define when the standards/ conditions have been exceeded?

condition 4 - how to quantify this?

See figure 5.

Pilot study: “compliance behaviour”

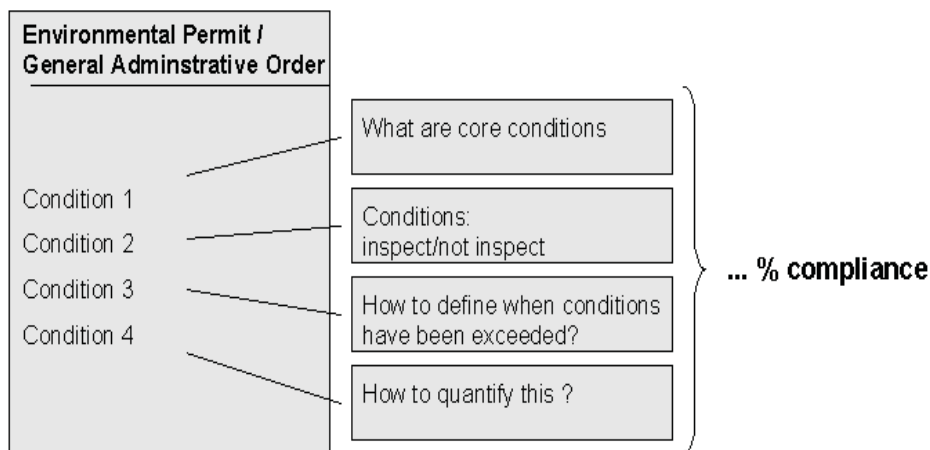
A well-chosen indicator of compliance behaviour should make it possible to get an impression of the environmental performance of a certain economic branch. The biggest challenge lies in calibrating representative (values of) permit conditions for the compliance behaviour in that branch. For instance, the principal conditions for gas station are about safety and soil protection, to be guaranteed through measures such as a liquid-proof floor and facilities to extinguish fires. In case of the catering industry prevention of noise hindrance is most important. If the noise level is 2 dB(A) above the standard, can this be compared to the absence of a liquid-proof floor?

One way to deal with this problem is to distinguish between three levels of violations, and to weigh each level differently in the “compliance rate”:

1. minor violations/hindrance;
2. environmental damage;
3. safety involved.

For some years now the water control boards active within Rijnmond (Directorate General for Public Works and Water Management and the water control boards for the inland waterways) have composed their own compliance rate, in order to see the results of inspections on Pollution of Surface Waters Act conditions.

Figure 5: Decisions to make developing an indicator of compliance behaviour.



We recommend exploring the possibilities for a similar compliance rate as an indicator for the results of inspections on Environmental Management Act conditions.

In a pilot study the following questions should be answered:

1. What's the principal environmental aspect in this branch?
2. What conditions must a company to comply with in order to prevent environmental pressure?
3. What sort of violations of these conditions can we expect?
4. To what degree can we expect conditions to be violated?
5. What environmental pressure will result from these violations in this degree?
6. What score can we give to each degree of violation?

Subsequently a score-chart can be developed for every branch. The scores on violations will be based on the judgement of the inspector involved. The score-chart will neutralise differences between branches as much as possible and will make it possible to give an overall picture. Suppose the compliance rate composed by means of the score-chart is 90 for gas stations and 85 for the catering industry, the last branch should get enforcement priority in the years to come.

Conclusion

Even if the budget and manpower, available for enforcement, were not limited, a hundred percent compliance for all conditions would not be feasible, regardless of the intensity of inspection. To practise enforcement means that choices have to be made and priorities have to be set. It is in the common interest to make the choices as translucent as possible, for civilians, companies, administrators and the legislator alike.

It is not enough to invest only in improving enforcement, as this is only one of the policy instruments to reach the targets set. Improving the quality of legislation can lead to more output of enforcement and more decisiveness.

Also, decisive enforcement requires a systematic and programmed approach, in which the administration sets the priorities and indicates what branches and environmental aspects are important. Enforcers in their turn report to the administrators and point out legislation that is unfit for enforcement.

Finally, it is of great importance to gain insight into the results of enforcement and to report on this to the administration. In Rijnmond, the feasibility of a "compliance rate" at the level of branches is investigated in a pilot study. If this succeeds, the policy cycle, with enforcement as its final element, can be completed. This will allow us to make better use of enforcement as an instrument of environmental policy.

The profit of this will be high. To begin with, all bodies involved will be better able to account for their policy on enforcement. This way administrators will gain more insight into the results of their own decisions. Managers will have at their disposal a tested and methodical instrument for the input of personnel and inspectors will have more clarity on the environmental relevance of their activities. Finally, civilians will deal with a government with a translucent and consistent policy on enforcement, making it possible to accommodate and give recognition to those taking responsibility for compliance with the rules.

5.2 Asbestos: the state of affairs

Introduction

Asbestos is the generic term for a group of silicate minerals with a fibre-like structure. In the past century it was commonly used, in insulating materials, asbestos is strong, durable, insulating, incombustible and cheap. *Adhesive* asbestos contains fibres that are stuck in the material, so these will not be released into the air. This will only happen when the material is damaged, for example through drilling, sawing, or grating. *Non-adhesive* asbestos however, contains fibres that are not stuck into the material and these may well be released into the air without any manipulation. The microscopic, needle-like fibres can deeply penetrate the lungs through inhalation and can cause diseases like cancer of the lungs.

Not all forms of asbestos are equally dangerous: *white asbestos* (chrysotile) is less harmful than *blue asbestos* (crocidolite) or *brown asbestos* (amosite).

Through the concept of *fibre-equivalent*, the differences between different fibres in cancer-causing potential are taken into account. The lifelong inhalation of air with an average concentration of 1,000 fibre-equivalents per m³ will cause a so-called *negligible risk* of one casualty on every million inhabitants exposed. The risk increases as the period of exposure is longer and the dose is higher. The incubation time between exposure and the first symptoms of illness can be up to several decades. At the moment, an estimated 700 people die every year in the Netherlands of the consequences of exposure several decades ago.

Although it is now forbidden to use asbestos in the production of materials, asbestos containing materials can still be found all around us: in buildings, in the outside air, in the soil and in our drinking water. The government has already started the campaign against asbestos, for instance in the region of Rotterdam. What is the current state of affairs on this matter?

Reporting

Less than 2 % of the 20,000 complaints about environmentally related issues, received by DCMR's Incident Room in recent years, was related to asbestos. The number of reports on asbestosis is fairly stable through the years. During the period 1998-2001 the number of asbestosis related reports was 34, 35, 30 and 37.

In the year 2001 the Municipal Health Service of Rotterdam received 540 reports, of which 37 were related to asbestos. Apart from the Health Services, the commodity inspection department does research on asbestos. In 1999 the department received 1,064 requests to examine materials for the presence of asbestos. Although it is now forbidden to sell products containing asbestos, and these products are no longer in stock, asbestos is still part of many previously applied and durable products, such as floor covering and roof tiles. The requests make up over 20% of all complaints received by the department.

Inventory of asbestos in buildings

Buildings still contain a great deal of asbestos. This assumption is supported by a pilot survey among 50 buildings owned by the municipality, carried out in Rotterdam. In 33 buildings asbestos was found, in varying applications and amounts. The asbestos found has been classified into one of three priority classes, based on type, quantity, place and condition. The risk of release of asbestos fibres in priority 1 applications is very high. Amongst other materials this concerns asbestos chords in plug-sockets, ventilation channels and asbestos kit. Most of these applications are found in rooms only accessible for technical or maintenance personnel. Priority 1 asbestos was found in 12 buildings. If the situation allows it, sanitation can be postponed until the next planned service check. If not, the application must be replaced at once.

Last year the inventory was prolonged, now for all buildings in Rotterdam. It is estimated that there are at maximum 1,500 buildings in Rotterdam likely to contain asbestos.

Asbestos in the air

The concentration of asbestos particles found in the air today lies below the negligible risk level. During the period 1980-1990 measurements showed that the concentration of asbestos fibres in the Dutch' outdoor air was between 1,000 and 16,000 fibres per m³ in urban areas. Due to a variety of measures taken (amongst which the banning in 1991 of application of friction materials in cars, holding asbestos) it is to be expected that the present concentrations will be lower. However, in recent years there has been no systematic research carried out to confirm this. Random sample surveys carried out by TNO show that the present concentration in the outdoor air is below 100 fibres per m³; well below the negligible risk.

Only in tunnels and during demolition activities, levels higher than the negligible risk are found.

Asbestos in water

Because asbestos cement has been applied in drinking water pipes it is common to find asbestos fibres in drinking water. Concentrations found in water are about a million fibres a gallon. This means that the intake of asbestos fibres through the consumption of drinking water is many times more than through inhalation. However, swallowing asbestos fibres has virtually no impact on health.

Asbestos in the soil

Little is known about the presence of asbestos in the soil. However, recycled soil, originating from the urban area of Rotterdam, was investigated last year. In three out of the ten soil depots investigated, non-adhesive asbestos was found. In one soil depot adhesive asbestos was found.

Some remarks on handling asbestos contaminated soil can be made. In the Rijnmond area, millions of tons of construction debris granulate are being re-used in road construction and as an underlay for pavements. In many cases granulate (so-called repak or mixed granulate) does not meet the present strict standard for residue-concentration of asbestos in the soil.

Soil remaining after road maintenance should therefore be dumped. Handling this soil must be according to the regime set for "asbestos works".

It is an open question whether or not handling of asbestos-containing soil leads to a relevant exposure of employees to asbestos. At the time of handling the soil (taking samples, dumping), higher levels of asbestos fibres were not found in the air. Standards set for asbestos in the soil are probably too high.

Communication

Communication on asbestos matters is often troublesome, as the word asbestos has an unpleasant sound to it for many people. If asbestos has been found in a certain neighbourhood, panic is likely to break out, although not everyone will worry about it to the same degree. Civilians appear to be more sensitive to information on the possible consequences of asbestos than they are to information about the likelihood of these consequences. People usually overestimate the risks to a great extent. This is caused by the involuntary nature of disposal, but also by the absence of control over the risk and the lack of advantages of exposure. Besides which, government policies can be confusing: the legislation on asbestos is a lot more severe than it is for smoking. Inhalation of asbestos fibres can be compared to passive smoking, as both forms of exposure are involuntary, and the long-term consequences on health are similar (cancer). Moreover: passive smoking can be more harmful to health than a relatively high exposure to asbestos fibres.

5.3 Air pollution along arterial roads

In chapter 2 we mentioned that most breaches of the limit values for air quality occur in the immediate vicinity of busy arterial roads. This breach can reach hundreds of meters from the road. This prohibits the municipality concerned from building in such a zone. The Province of Zuid-Holland asked TNO to calculate the air quality along national highways and busy provincial roads more thoroughly. The results are presented in the map below. The map shows the concentration of NO₂ in a zone of 750 meter on both sides from the centre of the road. The calculations are based on the situation in 2000.

The air quality standard is breached in nearly all zones by an average yearly concentration of 40 µg/m³. The map does not show where the zones coincide with residential areas, but each municipality has a topographic map in which their zones have been drawn. It is highly likely that the zone crosses residential areas along the A13 and the A20 in Rotterdam. Breaches also occur in some parts of Schiedam and Vlaardingem along the A20. In the south of Rotterdam, the A16 causes breaches in some areas and in the south, parts of the Groene Kruisweg do the same.

Calculations for roads in the inner-city of all municipalities in the Rijnmond area have recently been completed, enabling the obligations ensuing from the Air Quality Resolution to be met. It appears that along more than 750 kilometres of roads examined in Rijnmond the concentrations are above 40 µg/m³.

The concentration of NO₂ must meet the air quality standard by 2010 at the latest.

The Air Quality Resolution has been accepted, based on the assumption that the air quality standard of 40 µg/m³ can be met in 2010 if the average annual concentration in 2001 is below 58 µg/m³. This 58 µg/m³ is called the plan threshold (plandrempel). This assumption is based on the expectation that cars will become cleaner and that the background concentration will decrease. If the plan threshold is exceeded in 2001 the municipality must make a plan that contains measures which ensure that by 2010 no one is exposed to bad air quality. It is expected that such a plan will contain measures regarding both spatial planning and traffic management. Calculations show that along 35 kilometres of the roads examined the concentrations also exceed the plan threshold. The municipal reports will have to show whether this is only caused by national highways and busy provincial roads or also by inner city roads.

The concentrations of fine particulate along roads are often too high. Fine particulate however, present a problem on a much larger scale compared to NO₂ because it is spread over a much greater distance. Due to this the background concentration is much higher and is coming from other parts of the Netherlands and even Europe. Local sources and car traffic are responsible for local rises in concentration and often also for the breach of the air quality standard. The national government however is responsible for ensuring source-orientated measures on a European scale.



We have monitored environmental policy based on the subdivision quality-sources-efforts for several years. The subjects we report on do not remain static. Incidents and social developments lead to different accents in policy and sometimes even to new policy. The role of monitoring in this must be to provide adequate information that in turn gives a clear indication of subjects still needing to be addressed. This final chapter addresses the developments we want to consider in the (near) future.

Although the MSR-report has remained more or less the same in recent years, international developments make changes necessary.

Thematic approach

To begin, we consider a thematic approach. Many regional and provincial reports do not use the internationally used quality-sources-efforts approach but for example a thematic classification. A thematic approach corresponds with the professional organisation of governments and the perception of inhabitants. At the level of the national government a list of 36 indicators has been made for the municipalities as proposed by a national committee (CCO).

Integrated forecasting and evaluation

We also consider forecasting instead of only evaluation, though evaluation is the norm in monitoring reports. This ongoing integration of monitoring and policy making is an important development. In many reports such as the environmental evaluation 2000 of Rotterdam an advance is being made in formulating policy. In some cases evaluation and forecasting are even being integrated.

MSR survey 2002

Finally, it is likely that changes will be made resulting from our recent survey. A short briefing. The MSR-report must meet the wishes of its users where possible. In order to judge if this is the case and to anticipate the wishes for the years to come a survey was held among the all recipients of the report 2002. The subjects that were addressed are, amongst others, the desirability of an electronic version (MSR on Internet), appearance, contents, structure and distribution. For a detailed, written survey the response of over 30% was a good result.

Based on the results we shall hold follow-up interviews with a small selection of respondents. The co-operating governmental agencies will be asked to take action based on the findings of the survey and the interviews. In October, they will decide on the future appearance, structure and contents of the MSR report for both the short and long term. Hopefully the improvements will be apparent in the MSR2003-report.



'The environment in the Rotterdam region 2002'

Overview indicators per page

Indicator	page	chapter	type	name
MI_9002	21A	2.1	line	Index quality national waters
MI_9006	21B	2.1	line	Average ecological quality inland waters
MI_9007	21C	2.1	line	Eutrophication of surface waters
MI_9008	21D	2.1	line	Heavy metals in surface waters
MA_1039	22A	2.1	line	Heavy metals in sludge, national waters
MA_1040	22B	2.1	line	Organic micro pollutants in sludge, national waters
MA_1041	22C	2.1	bar	Ecological quality large inland waters
MA_1028	22D	2.1	line	Quality in relation to function inland waters
MA_1025	23A	2.1	bar	Intake stops Meuse water (drinking water production)
MI_9003	23B	2.2	line	Index air quality
MB_3075	23C	2.2	line	SO ₂ in air, 99.2-percentile daily averages
MB_3072B	23D	2.2	line	NO ₂ in air, 99.8-percentile hourly averages
MB_3067	24A	2.2	line	Benzene
MB_3049	24B	2.2	line	Benzo(a)Pyrene
MB_3079	24C	2.2	line	Fine suspended particles
MB_3073	24D	2.2	line	Ozone
MB_3082	25A	2.2	bar	Smog
MB_3083	25B	2.2	bar	Signalling codes
MB_3085	25C	2.3	line	Complaints about odour, dust and noise
MB_3003	25D	2.3	line	Complaints about noise
MB_3087	26A	2.3	map	Odour, complaints per municipality
MB_3088	26B	2.3	map	Dust, complaints per municipality
MB_3089	26C	2.3	map	Noise, complaints per municipality
MB_3029	26D	2.3	line	Nuisance by industry
MB_3052	27A	2.3	line	Nuisance by noise and odour by road traffic
MB_3061	27B	2.3	line	Experienced health due to air pollution
MB_3058	27C	2.3	line	Marks for environmental quality
MB_3035	27D	2.3	map	Acoustic load by industry
MD_7004	28A	2.3	line	Handling of environmental complaints by Municipal Health Services
MD_7076	28B	2.3	bar	Environmental complaints police
MI_9015	28C	2.4	line	Index nature quality
MCB_5055	28D	2.4	line	Number of butterflies
MA_1047	29A	2.4	bar	Natural banks (inland waters)
MA_1049	29B	2.4	bar	Number of seals
MA_1050	29C	2.4	bar	Number of common terns
MA_1052	29D	2.4	bar	Number of redshanks
MA_1051	30A	2.4	bar	Number of water birds

MB_3030	30B	2.4	line	Number of summer birds
MI_9004	33A	3.1	line	Index environmental pressure major industries
MA_1030	33B	3.1	line	Discharges heavy metals by major industries
MA_1031	33C	3.1	line	Discharges PAH and pesticides
MA_1032	33D	3.1	line	Discharges benzene and chlorides
MA_1004	34A	3.1	line	Discharges phosphate and nitrogen
MA_1007	34B	3.1	line	Discharges oil
MB_4001	34C	3.1	line	Emission acidifying compounds
MB_4002	34D	3.1	line	Emission carcinogenic compounds
MB_3009	35A	3.1	line	Emission hydrocarbons
MB_3025	35B	3.1	line	Emission particles
MB_3092	35C	3.1	line	Emission heavy metals waste incinerators
MB_3094	35D	3.1	line	Emission dioxins waste incinerators
MB_3006	36A	3.1	line	Emission CO ₂
MB_1046	36B	3.1	line	Use of groundwater by major industries
MI_9005	36C	3.2	line	Index environmental pressure road traffic
MB_3028	36D	3.2	line	Number of car kilometres driven
MB_3086	37A	3.2	line	Emission factors road traffic
MB_3046	37B	3.2	line	Emissions road traffic (CO ₂ , NO _x , hydrocarbons, particles)
MCA_6001	37C	3.3	line	Domestic waste (total)
MD_7081A	37D	3.3	line	Electricity use consumers
MD_7081B	38A	3.3	line	Natural gas use consumers
MB_3027	38B	3.3	line	CO ₂ -emission consumers
MCB_5054	38C	3.4	line	CO ₂ -emission agriculture and horticulture
MCB_5053	38D	3.4	bar	Discharge of eutrophication substances by agriculture and horticulture
MB_3090	39A	3.5	pie	Comparison of emissions of target groups
MCB_5051	39B	3.5	line	Acidic deposition
MI_9010	39C	3.6	line	Refineries (environment and economy)
MI_9011	40A	3.6	line	Chemical industry (environment and economy)
MI_9012	40B	3.6	line	Power plants (environment and economy)
MI_9013	40C	3.6	line	Storage and transshipment (environment and economy)
MI_9014	40D	3.6	line	Road traffic (environment and economy)
MD_7053	43A	4.1	line	Households in EcoTeams
MD_7095	43B	4.1	bar	Environmental care projects (small industries)
MD_7031	43C	4.1	bar	Implementation internal environmental care in industries
MD_7079	43D	4.1	map	Implementation internal environmental care per municipality
MG_8015	44A	4.1	map	Municipal Environmental Policy Plan per municipality
MB_4017	44B	4.1	map	Car restriction zones per municipality
MB_4018	44C	4.1	bar	60 km/hr zones
MG_8013	44D	4.1	bar	Education of nature and environment in Rotterdam
MD_7092	45A	4.2	bar	Use of green power (households)

MG_8012	45B	4.2	map	Use of green power per municipality
MD_7082	45C	4.2	line	CO ₂ -reduction through energy saving
MD_7083	45D	4.2	bar	CO ₂ -reduction through sustainable energy
MD_7080	46A	4.3	bar	Effective level of measures (major industries)
MD_7072	46B	4.3	line	Enforcement refineries
MD_7075	46C	4.3	line	Enforcement process industry
MD_7073	46D	4.3	line	Enforcement storage and transshipment
MD_7091	47A	4.3	line	Enforcement power plants
MD_7090	47B	4.3	line	Enforcement waste processing plants
MD_7086	47C	4.3	line	Enforcement cattle farms
MD_7087	47D	4.3	line	Enforcement cultivation under glass
MD_7088	48A	4.3	bar	Enforcement stevedore companies
MD_7024	48B	4.3	line	Enforcement municipal industries
MD_7094	48C	4.3	bar	Enforcement by police
MB_3016	48D	4.4	line	Ecological bottlenecks
MC_5037	49A	4.4	bar	Nature reserves
MB_3031	49B	4.4	bar	Urban green in Rotterdam
MB_3004	49C	4.5	line	Noise abatement measures to be implemented
MB_4019	49D	4.5	line	Allowed higher noise levels houses
MG_8004	50A	4.5	map	Availability of soil quality map
MCB_5046	50B	4.5	bar	Cleanup of new contaminated soil
MCB_5058	50C	4.5	bar	Soil protection act
MCB_5060	50D	4.5	pie	Use of soil cleanup possibilities
MCB_5048	51A	4.5	bar	Soil cleanup of industrial sites
MCB_5049	51B	4.5	bar	Soil cleanup former gas work sites
MCB_5050	51C	4.5	bar	Soil cleanup former petrol stations
MD_7062	51D	4.5	map	Cleanup of underground tanks
MA_2018	52A	4.5	map	Hazardous points of overflow of water per municipality
MG_8014	52B	4.5	map	Buildings without sewerage per municipality
MC_5010	52C	4.6	bar	Domestic waste
MC_5004	52D	4.6	line	Separately collected domestic waste
MD_7063	53A	4.6	map	Separate waste collection per municipality (organic and rest)
MG_8002	53B	4.6	map	Separate waste collection per municipality (glass, paper and textile)
MCA_6005	53C	4.6	map	Separate waste collection per municipality (and asbestos)
MC_5027	53D	4.6	line	Ships' waste inland shipping
MC_5028	54A	4.6	line	Ships' waste sea shipping
MC_5014	54B	4.6	line	Quality and quantity of sludge
MCB_5041	54C	4.6	pie	Destination of contaminated soil
MCA_6004	54D	4.6	pie	Waste of major industries
MB_4016	63	5.3	map	NO ₂ pollution along arterial roads
INWON_02	67	BY1	map	Municipality borders and number of inhabitants