

**Australian Government** 

Department of the Environment and Heritage

# National Pollutant Inventory Summary Report

# About this report

The National Pollutant Inventory (NPI) is the only nationwide, publicly accessible inventory of substance emissions in Australia.

By visiting <u>www.npi.gov.au</u>, the community, government and industry can explore a key source of information about pollution in Australia. The NPI programme was established in 1998, to collect and collate the nation's emission data. It is a cooperative effort by the Australian, state and territory governments to help create a cleaner and healthier environment.

This summary report gives an overview of emissions reported during 2004-05. Data reported by facilities for that year were published on the internet (www.npi.gov.au) on 31 January 2006.

This report uses the data available as at 31 March 2006.

2004-05

It is important to understand that industry calculates their emissions using various methods, including direct monitoring, emission factors, mass balance and engineering calculations. Consequently, data accuracy varies according to the calculation technique used.



>>	Outline	2
>>	Key points	2
>>	Why do we need the NPI?	2
>>	Cleaner production	3
>>	The NPI and you	3
>>	The NPI web site	4
>>	Sources of emissions	5
>>	Diffuse sources	6
>>	Facility sources	7
>>	Industry sector sources	7
>>	Substance emissions	9
>>	Where do emissions go?	11
>>	What next for the NPI?	14
>>	NPI contacts	15
>>	Abbreviations and definitions	15

More than half of the NPI substances showed a drop in reported emissions

this year.

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National Pollutant Inventory Tracking emissions across Australia

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# Outline



# Welcome to the seventh summary report of the National Pollutant Inventory (NPI).

This report presents an overview of activities during 2004-05, together with examples of the types of information you can find on the NPI web site and tips on how to use the data.

The report also explains why substances are included in the NPI, and discusses the sources and paths of substance emissions to air, land and water.

Finally, this summary contains a set of useful links as well as contact details of government agencies involved in the NPI.

- 2004-05 was the seventh year for NPI facility reporting.
- 3826 facilities reported to the NPI 5.4% more than the previous year.
- Facilities reported on 85 of the 90 NPI substances.
- More than half of these substances had decreased reported emissions compared to last year's data.
- The metal ore mining sector reported the largest amount of emissions to the Australian environment.
- The Australian Government together with the states and territories pursues a range of initiatives to reduce emissions and protect our environment.
- The NPI web site continues to be updated, making it easier to use.

# Why do we need a National Pollutant Inventory?

Australia's NPI is one of many pollutant release and transfer registers (PRTRs) around the world. Others include Canada's National Pollutant Release Inventory (NPRI) and the US Toxics Release Inventory (TRI).

Governments provide this tool to inform the community about chemicals being emitted into the environment. The community's right to know was the priority in the 1996 Organisation for Economic Cooperation and Development (OECD) recommendation that all OECD member countries provide public access to information concerning pollutant releases and transfers from various sources.

The legislative framework underpinning the NPI is called the NPI National Environment Protection Measure (NPI NEPM). This was the nation's first NEPM and was

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**National Pollutant Inventory** 

Tracking emissions across Australia

agreed to by the Australian, state and territory governments in 1998. NEPMs set out agreed national objectives for protecting or managing particular aspects of the environment.

The main purpose of the NPI is to collect and publish information about emissions of substances to help environmental decisionmaking, to meet community right-to-know obligations and raise awareness of the need for cleaner production and waste minimisation.

## **NPI NEPM** goals

- Maintain and improve ambient air quality and ambient marine, estuarine and fresh water quality
- Minimise environmental impacts associated with hazardous wastes, and
- Expand the re-use and recycling of used materials.

More about the NPI NEPM

# **Cleaner production**

A 'facility' means any building or land from which a substance may be emitted, and includes the machinery and equipment used to carry out work at the facility. One of the main goals of the NPI is to encourage facilities to use cleaner production techniques to reduce substance emissions and decrease waste. Reporting facilities have the option of reporting on cleaner production activities and pollution control developments that they have undertaken during the reporting year.

Since NPI reporting started, 1050 facilities have provided information on their emission reduction activities. The most common reduction techniques are: improving maintenance scheduling, record-keeping or procedures, and implementing inspection or monitoring programmes for potential spill or leak sources. The most common types of pollution control equipment reported are scrubbers and fabric filters.



# Find out more about cleaner production

The Australian Department of the Environment and Heritage's web site contains case studies designed to help small to medium sized businesses better understand how to improve their methods of production.

Examples are also included in some state and territory environment agencies web sites.

More about cleaner production

# The NPI and you

The NPI is a starting point to learn about emissions in your local community, your state or the nation. NPI data shows what is being released from an emission source, but there are additional factors that contribute to pollution of our air, land or water. Whether emissions of a substance cause pollution depends on the amount of substance emitted, where it is emitted, the weather conditions at the time and the topography of the land.

States and territories are responsible for pollution control. To report pollution incidents contact your relevant state or territory environment agency. For more information see contact details at the end of this report.

# The NPI can provide you with:

- full details of individual facilities reporting to the NPI
- a ranking of substance emissions from a particular facility compared with the largest emission from any facility for that year
- substance sources and emissions for your postcode, local area, city, state or the nation
- interactive maps showing substance sources and destinations
- diffuse emissions estimated in airsheds or water catchments

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- a downloadable spreadsheet of emissions that can be analysed off-line
- health and environmental fact sheets about the 90 NPI substances
- tips on what you, government and industry can do to help reduce pollution and
- industry reporting materials to assist industry calculate and report their emissions.



# The NPI online database is at <u>www.npi.gov.au</u>

In 2004-05, the web site received more than 117 000 visits, 29% more than the previous year. A 2005 survey of web site users found that most were visiting or revisiting for either educational or industry reporting purposes.

- A targeted resource for industry, government, schools, and others
- Easy to navigate
- Quick postcode and facility searches
- Frequently asked questions
- Glossary of terms

Veb site features

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- Easy access to reports and maps for the whole country
- A regular <u>NPI newsletter</u> available by email subscription



#### Get easy access to 2004-05 reports for the whole country and individual states or territories.

Australia
Australian Capital Territory
New South Wales
Northern Territory
Queensland
South Australia
Tasmania
Victoria
Western Australia

## How to use the NPI data

- The NPI contains two types of data emissions from facilities and diffuse emissions. Facilities calculate or monitor their emissions and provide this data annually for the NPI. Diffuse data shows the contribution of non-industrial sources to Australia's emissions. The diffuse data is not collected annually and so is not necessarily for the particular facility reporting year being examined. For example, diffuse data may be from a study completed in 1998-99 and the facility data from 2004-05, however it is the most up-to-date information available.
- The 90 NPI substances range in toxicity, for example, a small amount of a highly toxic substance may be more significant than a larger emission of a less toxic substance.
- It is misleading to add together emissions of different substances. This does not provide a measure of total pollution because NPI substances have differing properties and toxicities.
- The NPI is made up of emissions which have been estimated using a variety of techniques. The accuracy of these estimates may vary according to the technique used.
- If an error has occurred in the data for the most recent reporting year, changes will be made in April following the annual data publication in January. For information on recent corrections/ additions to NPI data check the data changes notification page – more about data changes.
- On the NPI emission reports, indicative top sources are derived by converting each substance emission into proportional units. This provides an equal weighting for each substance, but does not consider any variation in hazard or possibility of exposure to substances – more about understanding NPI reports.
- The Environment Protection Authority South Australia has published an interpretive guide to the NPI that can help you understand the aims and use of the NPI – more about the EPA SA interpretive guide.



# Sources of emissions

The blue crosses on the map below show NPI reporting facilities for 2004-05, as well as the locations of completed diffuse emission studies for water catchments and airsheds. Regions included in diffuse studies cover more than 75% of Australia's population.



# **Diffuse sources**

Emissions from sources such as aircraft and motor vehicles, as well as from activities such as barbecues and lawn mowing, are estimated by state and territory agencies. Emissions from facilities that do not reach the threshold levels required for reporting, such as printers and spray painters, are also included in the diffuse emissions.

Most of the 90 NPI substances are considered in diffuse emissions to air in airshed studies. However, only total nitrogen and total phosphorus are determined in most water catchments.

The boundaries of NPI airsheds are selected by government agencies. A total of 33 studies were completed by the end of 2004-05, covering all capital cities and many urban regions in Australia. In 2004-05 the Port Phillip, La Trobe, Ballarat, Bendigo and Mildura regional studies were updated.

The boundaries of water catchments are determined by the drainage of interconnected river systems, which sometimes cross state or territory borders. To date, 32 catchment studies have been completed for the main urban and rural areas in Australia.

#### **Emissions from major diffuse sources**

 Per cent emissions
 Diffuse sources

 45
 40
 35
 30
 25
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# Key Capital Cities NPI Reporting Facilities (2004-05) NPI Airsheds non reporting facility emissions to air NPI Catchments nutrient emissions to water



An airshed is a body of air, bounded by meteorology and topography, in which substance emissions are contained. For example, the Bunbury airshed study area is 165 km (eastwest) and 234 km (north-south) comprising a population of 270 000 people.

More about the Bunbury airshed study

The major diffuse sources of substance emissions to the environment are listed in the table below. The most significant diffuse source across the nation is motor vehicles.



# Diffuse sources

The Australian Government in cooperation with states and territories undertakes a range of initiatives to protect our environment. Some of these initiatives include reducing pollution from motor vehicles and smoke from wood heaters.

# **Reducing pollution from motor vehicles**

National initiatives to reduce the impact of road transport on environment quality, urban amenity and human health are:

- improving the emissions performance of the Australian vehicle fleet by:
  - improving fuel quality
     from 1 January
     2006 new fuel
     quality limits came
     into effect limiting
     benzene in petrol
     to 1%
  - limiting sulfur in diesel to 50 ppm *and*
  - limiting poly-aromatic hydrocarbons in diesel

- reducing in-service vehicle emissions through:
  - developing an inventory of emissions from the current vehicle fleet and
  - encouraging fuel efficient and environmentally friendly vehicles and technologies
- addressing the nature and growth of vehicle travel by:
  - improving sustainable transport, including encouraging high occupancy vehicle use and promoting walking, cycling and public transport and
  - integrating land use and transport planning and promoting uptake of intelligent transport systems
- managing and promoting the product stewardship for oil programme by:
  - providing incentives to increase used oil recycling in the Australian community to ensure the environmentally sustainable management of used engine oil.





# What is a catchment?

A catchment is the land area drained by a creek or river system. For example, the Murray Darling Basin covers 1 061 469 square kilometres equivalent to 14% of the country's total area.

More about the Murray Darling Basin catchment



# Reducing smoke from wood heaters

To complement these efforts to cut motor vehicle pollution, other sources of urban air pollution such as wood smoke have been targeted. The Department of the Environment and Heritage is working with state, territory and local governments to reduce the amount of wood smoke in our urban areas.

#### This work includes:

- educating the community on the correct way to operate wood heaters
- seeking improvements to wood heater installation and emission standards
- sponsoring research to improve our understanding of wood heater emissions
- developing more stringent emissions standards and
- putting in place a robust certification procedure and auditing activities to ensure compliance with woodheater standards.



# National Pollutant Inventory Tracking emissions across Australia

# Facility sources

Every year Australian industrial facilities that use above specified amounts of the 90 NPI substances must estimate and report their emissions directly to their state or territory environment agency. These agencies review all NPI reports for accuracy and forward the data to the Australian Government. The reports are then displayed on the NPI public website at <u>www.npi.gov.au</u>.

The NPI now contains seven years of facility data. The graph below shows that the number of reporting facilities has increased in most jurisdictions. The total number of reporting facilities in 2004-05 was 3826 compared with 3629 the previous year – an increase of 5.4%.



#### Number of facilities reporting



In 2004-05, 388 facilities reported for the first time while 259 facilities that reported the previous year did not do so in 2004-05. Facilities may fall below the NPI reporting thresholds where previously they were above them because they have:

- introduced cleaner production methods
- changed production levels
- changed how emissions are determined or
- closed the facility.

# Industry sector sources

Facilities are grouped into industry sectors using the Australian and New Zealand Standard Industrial Classification (ANZSIC) codes. This enables each facility to compare its results against other facilities in the same ANZSIC code, and for the community and policy makers to track emissions from different industries.

Several sectors showed improvement in certain areas. For example, the iron and steel manufacturing sector has recorded significant reductions in oxides of nitrogen, particulate matter 10.0 micrometres or less in diameter (PM<sub>10</sub>) and sulfur dioxide. The basic non-ferrous metal manufacturing sector has also estimated reduced emissions in 2004-05 of carbon monoxide, oxides of nitrogen, PM<sub>10</sub> and zinc and compounds. >>

## Who reports to the NPI?

Australian industrial facilities that meet the reporting criteria are required by law to report to the NPI. The criteria are based on how much fuel, electricity and NPI substances they have used. More information about reporting to the NPI can be found in the <u>NPI Guide</u>.





National Pollutant Inventory Tracking emissions across Australia The mining sector is one of the fastest-growing sectors in the Australian economy, and it is also the highest industry sector emitter. Although overall emissions from this sector are higher this year due to the increased output, emissions of arsenic and compounds and chromium (III) compounds have dropped. Total arsenic and compounds emissions reported from industry sectors decreased significantly from 140 000 kilograms in 2003-04 to 95 000 kilograms in 2004-05.

This graph shows the 10 industry sectors that have the highest substance emissions in 2004-05. These sectors produce about 75% of total substance emissions estimated from industry.

Some sectors, such as metal ore mining, are big industries and by their nature are large emitters. Other sectors have many facilities reporting to the NPI but contribute relatively little to substance emissions. For example, the beverage and malt manufacturing sector has a high proportion of NPI facilities but does not contribute significantly to total emissions. Large industry emissions do not necessarily mean poor environmental performance.

#### Case study – a major industry sector reporting to the NPI – basic chemical manufacturing

The NPI database can be used to generate a report for a specific industry sector such as the basic chemical manufacturing sector. This sector makes a significant contribution to the Australian economy. Its facilities manufacture chemicals for use in the food, pharmaceutical, paper, carpet, automotive, building, hygiene and other industries.

A total of 105 facilities reported on 69 substances emitted in the 2004-05 reporting year, five more facilities than in the previous year. This sector is a major emitter of acrylic acid, 1, 3-butadiene, dichloromethane, ethylene oxide, methyl methacrylate, nitric acid, phosphoric acid and vinyl chloride monomer.

Largest industry sources



Note: Substances are not added together in this graph. For each substance a sector emits, the percentage of the sector's emission is compared to the national total for that substance and an average is taken. A similar approach is used for the location reports on the NPI web site.



In the past year the basic chemical manufacturing sector reported decreased emissions for PM<sub>10</sub>, cumene and fluoride compounds. For some other substances, such as acetic acid, oxides of nitrogen and mercury and compounds, reported emissions increased.

Changes in reported emissions can be due to improved environmental performance, increased production, changes to the process, installation of pollution control equipment such as fabric filters, the reporting of a substance for the first time and updated emission calculation techniques. >>

# Emissions of some NPI substances from the basic chemical manufacturing sector for the past two years

Substance to land, air and water	2003-04 (kg/year)	2004-05 (kg/year)	Change
Substance to land			
Ammonia (total)	92 000	87 000	5% decrease
Copper and compounds	63 000	65 000	3% increase
Substance to air			
Oxides of nitrogen	4.4 million	4.6 million	4% increase
PM <sub>10</sub>	5.2 million	2.2 million	58% decrease
Cumene	4700	1500	68% decrease
Fluoride compounds	610 000	350 000	43% decrease
Substance to water			
Total nitrogen	960 000	880 000	8% decrease
Ammonia (total)	1.4 million	1.3 million	7% decrease

# Substance emissions

The 90 substances on the NPI list have been chosen because of their potential impacts on health and the environment. Each year, the NPI gives a nationwide snapshot of these substance emissions. This information then helps policy makers and the community to find information on specific substances, and to monitor their changes over time.

In any one year, the NPI data presents a mixed picture with some emissions up and others down compared with the previous year. In the 2004-05 reporting year 85 substances were reported, with 42 substances showing an increase in emissions and 43 showing a decrease.

Substances that decreased significantly in reported total emissions include arsenic and compounds and chromium (III) compounds – mainly from the metal ore mining sector.

Substances that increased significantly in reported total emissions include benzene – mainly from the oil and gas extraction and petroleum refining sectors; and mercury and compounds – mainly from the metal ore mining sector.

Changes in reported emissions can be caused by changes in facility operations, increased production, better estimation of emissions and the installation of new pollution control equipment. >>

#### Looking for more information on NPI substances?

A list of the 90 NPI substances and related fact sheets can be obtained from the <u>NPI web site</u>.

These fact sheets describe how individuals might be exposed to a substance, the effects of exposure on people and the environment, common uses, comparative data and physical and chemical properties.



# What is an air toxic pollutant?

Australian Environment Ministers have listed benzene as an air toxic pollutant. Air toxics are gaseous, aerosol or particulate pollutants that are in the air in low concentrations and are toxic or persistent, making them a hazard to human, plant or animal life. The terms 'air toxics' and 'hazardous air pollutants' (HAPs) are used interchangeably.

There is growing recognition of the potential health risks associated with exposure to air toxics and of the need to minimise these risks. Exposure to air toxics has been linked with an increase in the incidence of cancer, birth defects, genetic damage, immunodeficiency, respiratory and nervous system disorders.

More about air toxics

National Pollutant Inventory Tracking emissions across Australia



# Benzene is one of the 90 NPI substances.

Most people are exposed outdoors to low levels of benzene from wood fires, tobacco smoke and car exhaust fumes/emissions. Smoking cigarettes and passive smoking, especially indoors, increases the intake of benzene. Individuals living near industries that produce or use benzene or living near freeways may also be exposed to higher benzene levels in the surrounding air.

Benzene is emitted mainly to air with smaller emissions to land and water.

The primary source of benzene emissions is motor vehicles followed by domestic wood burning. The Australian Government is focusing on reducing benzene emissions from these sources by introducing strict new fuel quality limits on benzene in Australian petrol. There are also programmes to help minimise smoke from wood heaters.

Benzene emissions estimated from industry rose by 33% over the past year, reflecting an increase in manufacturing and processing activities. The number of facilities reporting benzene in the 2004-05 reporting year decreased by 3%.

Industry accounts for 12% of all the estimated emissions of benzene based on airshed studies to date. In 2004-05, the largest reported source of benzene emissions was the oil and gas extraction sector, followed by the iron and steel manufacturing sector. The major industry sources of benzene are shown in the following pie charts.



The main sources of the top substances emitted to air are linked to our everyday lives i.e. electricity and motor vehicles. We can all contribute to reducing emissions by using cars less and saving energy at home and at work.

More about reducing pollution





# Where do emissions go?



Substances are emitted to air, land and/or water, and at times cause specific environmental problems when emitted to a particular destination. For example, high levels of total phosphorus emitted to water can result in plant and algal blooms.

# Emissions to air

Substance emissions to air are made up of emissions from facilities as well as diffuse source emissions.

In 2004-05, 83 of the 90 NPI substances were released to air making them the major component of all NPI emissions.

Emissions of the most commonly known air pollutants, such as carbon monoxide and  $PM_{10}$  remained steady in 2004-05. Although emissions of oxides of nitrogen were higher this year than last year, reduced amounts of sulfur dioxide, formaldehyde and polycyclic aromatic hydrocarbons were reported. The number of facilities reporting all of these substances also increased.

## Top five NPI substances emitted to air

The five NPI substances with the largest estimated emissions to air for 2004-05 from all Australian sources are listed below. Industry emissions are compared with motor vehicle and other diffuse sources as a percentage of total emissions for each of the five substances. Most of these substances are also listed in the Ambient Air Quality National Environment Protection Measure (NEPM) and are called 'criteria pollutants'. One key feature of criteria air pollutants is that they are generally widely distributed across the country.

#### Top 5 substances to air



National Pollutant Inventory Tracking emissions across Australia



Industry emissions
 Motor vehicle emissions
 Other diffuse source emissions





# **Emissions to water**

Substance emissions to water include emissions from facilities as well as diffuse emissions. Diffuse emissions are estimated within defined water catchments and usually (but not always) only include estimates of total nitrogen and total phosphorus.

Substances emitted to water



In 2004-05, industry facilities reported emissions of 58 NPI substances to water.

#### Major substances reported and change compared with 2003-04

Substance	Total emissions 2003-04 (kg/year)	Total emissions 2004-05 (kg/year)	Change
Total nitrogen	36.1 million	35.2 million	2% decrease
Ammonia (total)	21 million	19.8 million	6% decrease
Total phosphorus	9.9 million	9.8 million	1% decrease
Boron and compounds	1.4 million	2.4 million	71% increase
Manganese and compounds	1.3 million	1.5 million	15% increase
Fluoride compounds	1.2 million	1.2 million	Steady
Sulfuric acid	4 million	909 000	77% decrease

Sectors that are major emitters of substances to water include: water, sewerage and drainage; metal ore mining; and basic chemical manufacturing.

#### Ammonia (total) emissions to water

We are all regularly exposed to low levels of ammonia in air, water and soil. The amount of ammonia produced every year by man is very small compared to that produced by nature. Once emitted, ammonia does not stay long in the environment. It is recycled naturally in water via soil, plants and microorganisms. In 2004-05, 898 facilities (23% of all NPI reporting facilities) reported ammonia (total) emissions to water – an increase of 10% on the previous reporting year. Estimated emissions of ammonia to water from industry have dropped by 5% despite the growth in the number of facilities reporting the substance in 2004-05. Ammonia emissions vary among the sectors from year to year with the water, sewerage and drainage sector making up most of the facility emissions.

#### Top industry sector emissions of ammonia (total) to water

Ammonia to water	2002-03	2003-04	2004-05
Water supply, sewerage and drainage services	19 000 000	19 000 000	18 000 000
Basic chemical manufacturing	1 400 000	1 400 000	1 300 000
Iron and steel manufacturing	300 000	300 000	280 000
Meat and meat product manufacturing	120 000	70 000	90 000
Electricity supply	62 000	85 000	54 000
All others	33 000	41 000	32 000



National Pollutant Inventory Tracking emissions across Australia Total phosphorus emissions in the Murray Darling Basin

Phosphorus is an essential nutrient for all forms of life. It is most commonly used as phosphate in inorganic fertiliser. While having some phosphorus in our rivers, lakes and oceans is necessary, high total phosphorus levels together with high total nitrogen levels can lead to algal growth and deterioration in water quality. This can impact on its use for drinking water and other purposes.

The amount of phosphorus emitted to water in the Murray Darling Basin from reporting industrial facilities fell 33% during 2004-05. This drop reflects hard work by the Australian Government, relevant states and territories and the involvement of the community to improve the water quality of the Murray Darling Basin.





# **Emissions to land**



Emissions to land include seepage into soil and groundwater, as well as accidental spills, and leaks from facilities. The only emissions to land that are reported to the NPI are from facilities such as factories, not from diffuse sources such as motor vehicles. >>

#### How is waste disposal reported to the NPI?

Waste disposal or landfill facilities handle waste generated from other sources, such as business, industry and households. This transfer of waste is not reported to the NPI. Once the facility disposes of the waste on-site, the facility then becomes a pollution source and its emissions are reported to the NPI.

The largest emissions to land from landfill facilities were chlorine and ammonia. Landfill emissions can be found on the NPI database by looking at the waste disposal sector or the public order and safety services sector. A total of 53 NPI substances were reported as being emitted to land in 2004-05. The top five were ammonia, manganese and compounds, chlorine, fluoride compounds and nickel and compounds.

# **Did you know?**

- Land emissions of ammonia were mainly from water supply, sewerage and drainage services and meat manufacturing.
- Fluoride compounds were emitted from a range of sources, such as salt mining and alumina production and aluminium smelting.

# What next for the NPI?

The NPI team is currently developing a new NPI web-based process which will streamline industry reporting, facilitate analysis and improve data quality. Industry reporting materials to help industry calculate their emissions are being updated and enhanced, and will include simplified emission factors calculation tools. The web site is being redeveloped with an improved search facility and more intuitive data display.

In 2005 the NPI programme was reviewed to assess whether it was meeting its goals and objectives and whether it was benefiting the community, industry and governments. The review also looked at ways of making the programme more effective.

#### Read the review report

Following on from this review, Environment Ministers decided to start an NPI NEPM variation process. The scope of the NPI may be varied to:

- include data on the transfer of substances in wastes from a facility for the purpose of containment, destruction, treatment or energy recovery
- change reporting time frames
- include additional industries such as aquaculture and crematoria (others may be considered)
- make technical adjustments to the substance list and
   change the threshold for mercury, PM<sub>10</sub> and, if included on the NPI, PM<sub>25</sub>.

More information on the NPI NEPM variation process



## For more information

- For information on the National Pollutant Inventory, including access to the emissions data – visit www.npi.gov.au
- The links page on this site (at www.npi.gov.au/contacts/npilinks.html) can connect you to international pollutant inventories, consumer and business tips for helping the environment and other helpful sites.
- To find out how you can help reduce pollution – see <u>http://</u> www.npi.gov.au/about/reduce.html
- For further information on air, land and water quality, refer to state or territory agencies – see http://www.npi.gov.au/contacts/ index.html
- For information on the industry and business sustainability activities of the Australian Government Department of the Environment and Heritage – visit <u>http://www.deh.gov.au/</u> settlements/industry/index.html
- The State of the Environment 2001 Report provides information on a wide range of **environmental** issues – visit <u>http://www.deh.gov.</u> <u>au/soe/index.html</u>
- The Australian Government's greenhouse gas activities can be viewed at <u>http://www.greenhouse.</u> gov.au/index.html
- Ozone depleting substances are regulated by the Australian Government – see <u>http://www. deh.gov.au/atmosphere/ozone/</u> index.html
- For more information about NEPMs – see the Environment Protection and Heritage Ministerial Council's web site at <u>http://www.ephc.gov.au</u>



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Most of the nickel and compounds and manganese and compounds emitted originated from the metal ore mining sector.

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# Abbreviations and definitions

- ANZSIC Australian and New Zealand Standard Industrial Classification
   DEH Department of the Environment and Heritage
   NEPM National Environment Protection Measure
   NPI National Pollutant Inventory
- **PM**<sub>25</sub> Particulate matter 2.5 micrometres or less
- **PM**<sub>10</sub> Particulate matter 10 micrometres or less in diameter
- **TVOC** Total volatile organic compounds
- **Transfers** the movement of substances in waste for the purpose of containment, destruction, treatment or energy recovery.

More definitions in the NPI glossary

#### **Image credits**

P1: Crepuscular rays at Pyengana, M Brown; Brisbane city skyline, A Betts. P2: Eurobin Creek 3, Trevor J lerino; Argyle diamond mine, Dept of Foreign Affairs and Trade - Overseas Information Branch. P3: Brisbane city skyline, A Betts; infra-red drying - Toyota, J Baker; Tallebudgera Beach School Dune Care Demons, Rix Ryan Photography. P4: Eurobin Creek 3, Trevor J lerino; school children walking to school, A Betts. P5: Brisbane city skyline, A Betts. P6: Crepuscular rays at Pyengana, M Brown; fog and smoke over Canberra, ACT Environment Protection Section. P7: Eurobin Creek 3, Trevor J lerino; industry at Port Brisbane, A Betts; Kamberra winery, D Vernon. P8: Brisbane city skyline, A Betts; petrochemical plant, J Baker. P9: Brisbane city skyline, A Betts; traffic on freeway, J Baker. **P10:** Brisbane city skyline, A Betts; public transport in Melbourne, J Baker. P11: Crepuscular rays at Pyengana, M Brown; Bluescope steelworks stacks, G Rippon. P12: Eurobin Creek 3, Trevor J lerino; Lower Molonglo water quality control centre, D Vernon. P13: Eurobin Creek 3, Trevor J lerino; Victorian upper catchment, Trevor J lerino. P14: Brisbane city skyline, A Betts; water quality testing at Toyota, J Baker. P15: Crepuscular rays at Pyengana, M Brown; Eurobin Creek 3, Trevor J lerino.

