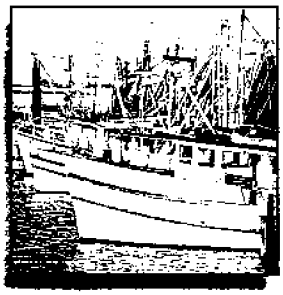
Australian Bureau of Statistics

1992–93 and 1993–94 4603.0

Environment Protection Expenditure

Australia









Environment Protection Expenditure, Australia

1992–93 and 1993–94

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AUSTRALIAN BUREAU OF STATISTICS

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INQUIRIES

- For information about other ABS statistics and services, please refer to the back of this publication.
- For further information about these statistics, contact Graeme Oakley on (Canberra) (06) 252 7369.

CONTENTS

PREFACE

This publication presents estimates of costs incurred for environment protection for a number of sectors of the economy. The industries included have been broadened from the data included in the 1991–92 edition and cover the public sector, agriculture, mining, manufacturing, retail, wholesale and service industries, and the household sector.

Statistics on this topic are important for a number of reasons. Firstly, they are indicative of the response of various sectors to environment protection regulations and policies. Secondly, the data will in due course be incorporated into environmental accounts to be developed by the Australian Bureau of Statistics (ABS) over the next few years. Finally, the statistics provide some indication of the demand for goods and services provided by the environment management 'industry'.

The ABS is continuing development work in the area of environment protection expenditure accounts. Future industry collections have been structured to provide information in accordance with emerging international frameworks in this field. In addition, efforts are underway to further broaden the coverage to include public sector environment protection expenditure.

The next edition of this publication, due for release in 1998, will present data for two financial years (1994–95 and 1995–96). It is intended that this publication be updated and released annually after this time.

Given the exploratory nature of this work, the ABS welcomes feedback from readers regarding the range and quality of the data and the explanations provided. Please send any comments to the Environment and Energy Statistics Section, Australian Bureau of Statistics, PO Box 10, Belconnen, ACT 2616.

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LIST OF ABBREVIATIONS AND OTHER USAGES

SYMBOLS AND OTHER USAGES

n.a	not available
n.c.	not collected
n.e.c.	not elsewhere classified
n.p.	not available for publication but included in totals where applicable
NO_x	Nitrous Oxides
. .	not applicable
—	nil or rounded to zero

LIST OF ABBREVIATIONS

ABS	Australian Bureau of Statistics
CEPA	Classification of Environment Protection Activities
COFOG	Classification of Functions of Government
CPI	Consumer Price Index
EPEA	Environment Protection Expenditure Account
GDP	Gross Domestic Product
GFS	Government Finance Statistics
GPC	Government Purpose Classification
OECD	Organisation for Economic Co-operation and Development
PAC	Pollution Abatement and Control
PTE	Private Trading Enterprise
SEEA	System for Integrated Environmental and Economic Accounting
SERIEE	European System for the Collection of Economic Information on the Environment
UN	United Nations

CHAPTER 1 COLLECTION FRAMEWORK AND SUMMARY RESULTS

INTRODUCTION

This is the third in a continuing series of Australian Bureau of Statistics (ABS) publications reporting on estimates of expenditure to protect the environment by Australian governments, the private sector and households. Since the first issue of this publication, released in January 1994, the scope for the collection of these statistics has broadened considerably, and data collection methodologies and presentation have been influenced and guided by changing international frameworks for the collection of economic data on the environment.

This edition presents estimates of environment protection expenditure for the 1992–93 and 1993–94 financial years for all industries included previously (manufacturing, mining agriculture, retail, wholesale), as well as the public and household sectors. In addition, estimates of waste management expenses have been collected for a number of other service industries to improve coverage in the private sector. These results have been combined with estimates by the retail and wholesale industries to report environment protection expenditure by the service industries as an additional chapter in this edition.

The ABS continues to collect and present comprehensive estimates of environment protection expenditure, by sector and industry on an annual basis for a number of reasons:

- they are indicative of the response of various sectors to environment protection regulations and policies;
- the statistics provide some indication of the demand for goods and services provided by the environment management 'industry'; and
- the data forms part of environmental 'satellite' accounts designed to augment the core system of national accounts. That is, environment protection expenditure accounts provide a disaggregation of existing figures in the national accounts to separately identify expenditure which has the specific purpose of protecting or repairing the environment.

INTERNATIONAL COLLECTION FRAMEWORKS

Work on estimating environmental expenditures was initially guided by the Organisation for Economic Co-operation and Development (OECD) Pollution Abatement and Control (PAC) framework. This framework was discussed in detail in the two previous editions of this publication, titled *Cost of Environment Protection, Australia, Selected Industries (1990–91* and *1991–92)* (4603.0). Much of the data collected from the private sector up to 1993–94 reflects the terms and definitions as specified by this framework. In particular, the OECD defined PAC as '...all purposeful activities directly aimed at the prevention, reduction and elimination of pollution or nuisances arising as a residual from production processes or from the consumption of goods and services' (OECD, 1994).

More recently, however, the ABS has moved towards collecting and presenting estimates on environment protection expenditure in accord with the United Nations System for Integrating Environmental and Economic Accounting (SEEA). SEEA contains a number

of environmental accounts, one of which relates to environment protection expenditure. The environmental protection account of SEEA has been developed considerably by the European Statistical Organization, Eurostat, in the European System for the Collection of Economic Information on the Environment (SERIEE). SERIEE has a broader scope than the OECD PAC framework, since it covers all environment protection expenditures, not just those relating to pollution abatement and control. In SERIEE, environmental protection '... groups together all actions and activities that are aimed at the prevention, reduction and elimination of pollution as well as any other degradation of the environment.' Thus the environment protection expenditure account of SERIEE includes expenditures on activities such as protection of biological diversity, soils and water, in addition to the traditional environment protection activities such as management of waste and protection of ambient air quality.

Although this edition follows a similar format to the previous edition, *Costs of Environment Protection, Australia, Selected Industries, 1991–92* (4603.0), the presentation of estimates have incorporated the approach inherent in SERIEE of valuing a broader range of expenditures beyond the narrower costs of abating and controlling pollution. Where possible, data have been presented according to the classification system underpinning SERIEE, namely the Single European Standard Classification of Environmental Protection Activities (CEPA). CEPA allows a division of activities according to the type of environmental pollution and the environmental media affected, and the type of activity performed (prevention, reduction, measurement, control). However, use of the SERIEE framework to measure environment protection expenditure in Australia is currently limited by constraints in the availability of data. It has therefore not been possible to adopt SERIEE as the basis for all the data presented in this publication. Rather, where data has been available SERIEE has been used to guide data collection and presentation. Otherwise the OECD PAC framework has continued to be used. As data becomes available in future years, environment protection expenditure will increasingly be reported in line with the sub-accounts provided within SERIEE.

The approach to data collection in all sectors has been to focus collection efforts on that expenditure considered to be most significant, with the remaining gaps being left unfilled for the time being. Although the resultant estimates may therefore be partial, they are conceptually in accord with emerging international practice for estimating environment expenditure, and are considered to capture the most significant expenditure in each sector.

SERIEE FRAMEWORK

SERIEE currently comprises two accounts: the Environment Protection Expenditure Account (EPEA) and the Resource Use and Management Account. Of these, the EPEA is more developed. The objective of the EPEA is to answer the following questions:

- how much a nation spends on environmental protection expenditure;
- how and by which units the expenditure is financed; and
- which economic activities are induced by environmental protection activities.

A detailed explanation of the SERIEE accounts was provided in the last edition of this publication (*Cost of Environment Protection, Australia, Selected Industries 1991–92* (4603.0)). In summary, the EPEA is drawn up by aggregation of sub-accounts. The sub-accounts provided within SERIEE are:

- ambient air and climate protection account;
- waste water management account;
- waste management account;
- protection of soil and groundwater account;
- noise and vibration abatement account;
- protection of biodiversity and landscape account; and
- other environmental protection activities account.

SERIEE also indicates that a range of more detailed sub-accounts can be developed to suit individual countries requirements and data availability situations. See the Explanatory Notes for a detailed listing of the Single European Standard Statistical Classification of Environmental Protection Activities and Facilities. General definitions and terms used in this classification system are described in the Explanatory Notes.

SERIEE has addressed a number of methodological issues associated with estimating environmental expenditures. It is much more detailed in its data requirements than the OECD PAC framework, and its implementation in Australia is in its infancy. The ABS will continue to monitor, explore and contribute to such international developments in the emerging area of environment expenditure statistics.

METHODOLOGY FOR ESTIMATING ENVIRONMENT PROTECTION EXPENDITURES

Two separate streams of activity were undertaken to estimate environment protection expenditure for 1992–93 and 1993–94. The first and major activity related to the collection and compilation of environment protection expenditure using data collected from existing ABS collections in a number of industry sectors, as well as extraction of data from ABS public finance records.

The second stream of activity involved researching a range of other sources for information on environment protection expenditure by the public and household sectors. Sources for this research included Commonwealth and State budget papers, annual reports of departments and public authorities, and contacts in local councils.

The first stream of activity was largely influenced by the OECD work on estimating pollution abatement and control expenditure, as described earlier. This OECD framework includes the collection of both capital and current expenditure incurred for pollution abatement activities by both the private and public sectors.

The OECD also suggests collection of data which identifies flows between the private and public sectors, including fees and charges paid by the private sector to the public sector, and grants and subsidies paid to the private sector by the public sector. These adjustments in theory make it possible to identify which sector is carrying the 'financial burden' of the pollution abatement activities, and ensures that expenditure is not 'double-counted' in both the public and private sectors. The estimates achieved by taking account of such flows are described as the 'financer principle' by the OECD model.

The estimate in table 1.1 also includes other environment protection expenditure by the public and household sectors originating from sources external to the ABS. Most of the items specified by SERIEE were covered in the data compilation, although the form in which the data were available did not make it possible to provide a detailed disaggregation.

1992–93 AND 1993–94 RESULTS

Table 1.1 provides a partial estimate for expenditure on environmental protection in 1992–93 of $6,430 million and 1993–94 of $6,506 million. This represented 1.6% and 1.5% of Gross Domestic Product (GDP) in 1992–93 and 1993–94, respectively. Private sector protection costs increased whereas public sector costs decreased, with the main contributor being reduced capital outlays in New South Wales.

This estimate is not directly comparable to the results released in the first two editions of this publication, as the sector coverage is wider. The coverage has also been extended from pollution abatement expenditure (as in the first edition) to include other environment protection expenditure, in line with SERIEE.

A number of data quality and coverage issues affect the estimate in table 1.1. As indicated above, although there are a number of points at which coverage has not been complete, the approach for all sectors has been to target the expenditure and activities considered most significant. Areas of data quality concern are:

- Difficulty in assessing the environmental protection costs associated with change-in-production (or integrated) technologies. These technologies have the dual aim of abating pollution and providing technical and commercial improvements in the way a business operates. The difficulty is establishing what proportion of the total cost should be allocated to pollution abatement and control, given that there could be other reasons for the acquisition of the new equipment including increasing capacity and efficiency. The approach taken by the ABS to this issue has been to ask respondents to include costs of equipment intended primarily for environment protection purposes (including complying with environment legislation). This approach will not include a proportion of expenditure for 'clean technology' equipment which has the dual aim of abating pollution and providing technical and commercial improvements in the way a business operates.
- The public sector data have partly been compiled using data classified according to the Government Purpose Classification. The categories of activities used for this publication included: household garbage, other sanitation, sewerage, urban stormwater drainage and other environment protection. Other environmental outlays also exist under a variety of government purpose classifications (e.g. agricultural land management, forests, etc.) but it is not possible to separate out the environmental component on the basis of the present classification. These estimates have therefore been derived from Commonwealth and State budget papers, as well as the annual reports of public sector departments. Efforts have been made, on this occasion, to categorise the other environment protection expenditure according to SERIEE. However, the structure of these documents meant it was not always possible to separate out the environmental from the non-environmental expenditures in some programmes and activities. In such cases, a conservative approach was taken, by including only that expenditure which could be specifically identified as environment protection.
- The estimate of the costs for the public sector to abate its own pollution are also underestimates at this stage and for this edition relate only to the public sector gas and electricity authorities. A more complete coverage of these costs in this sector would include expenditures for the general government sector, as well as the remaining government business enterprises.

1.1 ESTIMATES OF ENVIRONMENT PROTECTION COSTS

ENVIRONMENT PROTECTION COSTS...

Sector	1992–93 $m	1993–94 $m
PUBLIC SECTOR		
Sanitation and protection of the environment(a)		
Capital	1 106.0	1 008.0
Current	774.0	761.0
Total	*1 880.0*	*1 769.0*
Other identified environment protection costs(b)	1 073.5	1 172.1
Gas and electricity utilities		
Capital	80.9	56.9
Current	86.8	79.7
Total	*167.7*	*136.6*
Total public sector	*3 121.2*	*3 077.7*
PRIVATE SECTOR		
Agriculture(c)	96.3	112.1
Mining		
Capital	48.3	57.1
Current	95.7	128.8
Total	*144.0*	*185.9*
Manufacturing		
Capital	421.6	227.8
Current	574.2	473.7
Total	*995.7*	*701.5*
Service and other industries(d)		
Current	348.6	451.1
Household sector(e)	1 724.0	1 978.0
Total private sector	*3 308.6*	*3 428.6*
Total	**6 429.8**	**6 506.3**

(a) Refers to outlays supplied by ABS Government Finance Statistics.

(b) Expenditure derived from Commonwealth and State budget papers, and departmental annual reports. Combined capital and current figure.

(c) Capital/current split not available.

(d) Current expenditure only collected.

(e) In line with National Accounts Standards, all household expenditure is treated as current expenditure.

CHAPTER 2 PUBLIC SECTOR

INTRODUCTION

This chapter examines environment protection expenditure by the public sector for 1992–93 and 1993–94. As in previous publications, these costs are identified through a number of sources and cover government departments and associated bodies that deliver traditional public services (general government enterprises), as well as government trading and financial enterprises.

Included in this chapter are:

- outlays by general government and public trading enterprises on sanitation and protection of the environment provided by ABS Government Finance Statistics (GFS);
- other budget sector environment protection expenditures, not separately identified from the ABS GFS statistical framework; and
- pollution abatement and control expenditures by electricity and gas utilities, as identified from the ABS Census of Utilities.

These expenditures reflect partial estimates of environment protection expenditure by the public sector. Efforts continue to coordinate a more complete collection of these costs by Commonwealth, State and local governments.

OVERVIEW OF RESULTS

Table 2.1 provides an overview of partial expenditure on environment protection by the public sector. These estimates indicate environment protection expenditure by the public sector remained stable at $3.1 billion in 1992–93 and 1993–94.

2.1 PUBLIC SECTOR ENVIRONMENT PROTECTION EXPENDITURE(a)

	1992–93	*1993–94*
	$m	$m
Sanitation and protection of the environment(b)	1 879	1 769
Other environment protection expenditures(c)	1 074	1 172
Gas and electricity utilities	168	137
Total(a)	**3 121**	**3 078**

(a) Partial estimate only, as component items are underestimates. See footnotes (b) and (c).

(b) Refers to outlays provided by ABS Government Finance Statistics. Includes Commonwealth, State and local government outlays on selected environment protection activities.

(c) Derived from Commonwealth and State budget papers, and departmental annual reports. These estimates are additional to outlays reported in (b). However, some double-counting may occur with estimates supplied by Government Finance Statistics and allocated to the 'other' category.

SANITATION AND PROTECTION OF THE ENVIRONMENT

Government Purpose Codes (GPC) are described in table 2.2 and are based on the United Nations' (UN) *Classification of the Functions of Government* (COFOG). Information in tables 2.3 and 2.4 are coded to this classification. At the time of writing, COFOG had been earmarked for revision. One of the aims for this revision is to better identify environment-related activities of government.

Figures presented in tables 2.3 and 2.4 represent consolidated outlays of general government and public trading enterprises on activities defined as sanitation and protection of the environment according to ABS Government Finance Statistics classification system — GPC. Capital and current outlays of general government, and capital outlays and income transfer payments of public trading enterprises are included.

2.2 SANITATION AND PROTECTION OF THE ENVIRONMENT(a)

GPC(a) code	*Activity*	*Description*
731	Household garbage	Administration, regulation and support of household garbage, collection and disposal services.
732	Other sanitation	Administration, regulation and support of sanitary services other than household garbage such as the disposal of industrial waste and radioactive waste and cleaning of streets and gutters.
733	Sewerage	Administration, regulation and support of sewerage collection, treatment and disposal operations. Includes assistance for development, expansion and operation of effluent drainage systems and deep main town systems.
734	Urban stormwater drainage	Regulation, support and operation of urban stormwater drainage services such as the linking or lining of creeks and provision of open or deep draining systems.
739	Protection of the environment nec	Administration, regulation and support of specific activities which the other detailed level project codes do not cover. These activities include the development and operation of monitoring equipment for measuring air and noise quality. This category is also often used to code outlays on activities for which there is not sufficient information to allow coding to one of the four-digit codes from 0731 to 0734. For this reason, this category should be treated as a non-specific category.

(a) Government Purpose Classification codes.

Table 2.3 presents outlays on sanitation and protection of the environment by the level of government financing the activity. Specifically, this means data shown for any level of government represent expenditure of their own funds, including funds passed on in the form of specific-purpose grants or transfers to other levels of government. An exception is untied Commonwealth grants that have been passed on to State or local governments and expended on environment protection activities. Since these expenditures are for unspecified purposes and cannot be separately identified, they have been assigned to the level of government at which they were spent, rather than the level of government which provided the untied grant.

Total outlays reported by all levels of government on sanitation and protection of the environment amounted to $1,879 million in 1992–93 and $1,769 million in 1993–94. The 6% decrease is mainly attributed to a drop in capital outlays of 12% by the State governments, primarily on unspecified environment protection activities.

State governments financed the majority of outlays on sanitation and protection of the environment ($1,263 million in 1992–93 and $1,163 million in 1993–94), with most of the remainder accounted for by local government ($581 million in 1992–93 and $564 million in 1993–94). Together, sewerage and 'other' environment protection activities accounted for 76% ($1,428 million) and 81% ($1,436 million) of total outlays on sanitation and protection of the environment in 1992–93 and 1993–94, respectively. Most of these outlays were attributed to State governments ($1,172 million in 1992–93, and $1,119 million in 1993–94), whereas local government outlays were spread more evenly across all categories.

Tables 2.4 and 2.5 present outlays on sanitation and protection of the environment by State. Figures include State and local government outlays combined. The two most populous States, New South Wales and Victoria, together account for 70% and 67% of total outlays on sanitation and protection of the environment in 1992–93 and 1993–94, respectively. Sewerage collection, treatment and disposal operations is consistently the most capital intensive activity, with 85% (1992–93) and 80% (1993–94) of total outlays on sewerage operations being capital. Reporting inconsistencies may occur in the allocation of outlays to the various categories between States. Where figures were provided as an aggregate of 'sanitation and protection of the environment' (0730), the amount has been included under GPC 0739 — environment protection not elsewhere classified.

The slight decrease (6%) in total outlays for environment protection activities between 1992–93 and 1993–94, was primarily due to a 23% decrease in outlays by New South Wales. Most other States reported slight increases in outlays on these items. Per capita outlays revealed a significant increase between 1992–93 and 1993–94 for the two Territories, although their contribution to total outlays on sanitation and protection of the environment for Australia was small (combined 0.9% in 1992–93 and 2.0% in 1993–94).

As explained previously, these outlays are partial estimates only of environment protection expenditures by the public sector. They predominantly comprise activities and related expenditure on the SERIEE categories waste water management and waste management (GPC 0731–0734). Other environment protection expenditures, such as soil and groundwater, biodiversity and landscape protection, have been identified through other sources (see 'Other Identified Environment Protection Expenditures').

2.3 OUTLAYS ON SANITATION AND PROTECTION OF THE ENVIRONMENT

GOVERNMENT PURPOSE CLASSIFICATION

Level of government	Household garbage $m	Other sanitation $m	Sewerage $m	Urban stormwater drainage $m	Other PAC $m	Total $m
1992–93						
Commonwealth						
Current outlays	—	—	—	—	29.0	29.0
Capital outlays	—	—	6.0	—	—	6.0
Total outlays	—	—	*6.0*	—	29.0	*35.0*
State(a)						
Current outlays	—	39.0	111.0	1.0	301.0	452.0
Capital outlays	—	21.0	358.0	31.0	402.0	811.0
Total outlays	—	*60.0*	*469.0*	*32.0*	*703.0*	*1 263.0*
Local(b)						
Current outlays	73.0	122.0	(22.0)	98.0	22.0	292.0
Capital outlays	9.0	13.0	153.0	46.0	68.0	289.0
Total outlays	*82.0*	*135.0*	*131.0*	*144.0*	*90.0*	*581.0*
All levels						
Current outlays	73.0	161.0	89.0	99.0	352.0	774.0
Capital outlays	9.0	34.0	517.0	77.0	470.0	1 106.0
Total outlays	*82.0*	*195.0*	*606.0*	*176.0*	*822.0*	*1 879.0*
1993–94						
Commonwealth						
Current outlays		—	—	—	36.0	36.0
Capital outlays	—	—	6.0	—	—	6.0
Total outlays	—	—	*6.0*	—	*36.0*	*42.0*
State(a)						
Current outlays	—	8.0	137.0	4.0	302.0	451.0
Capital outlays	—	11.0	406.0	21.0	274.0	712.0
Total outlays	—	*19.0*	*543.0*	*25.0*	*576.0*	*1 163.0*
Local(b)						
Current outlays	38.0	123.0	8.0	65.0	42.0	274.0
Capital outlays	10.0	8.0	186.0	47.0	39.0	290.0
Total outlays	*48.0*	*131.0*	*194.0*	*112.0*	*81.0*	*564.0*
All levels						
Current outlays	38.0	131.0	145.0	69.0	380.0	761.0
Capital outlays	10.0	19.0	598.0	68.0	313.0	1 008.0
Total outlays	*48.0*	*150.0*	*743.0*	*137.0*	*693.0*	*1 769.0*

(a) Refers to outlays spent at the State government level only.

(b) Refers to outlays spent at the local government level only.

Note: Figures in parentheses represent negative outlays i.e. a net income was recorded for this item. Where figures have been rounded, discrepancies may occur between totals and the sums of the component items.

2.4 ENVIRONMENT PROTECTION OUTLAYS, By State—1992–93(a)

GOVERNMENT PURPOSE CLASSIFICATION

State/Territory	Household garbage $m	Other sanitation $m	Sewerage $m	Urban stormwater drainage $m	Other $m	Total $m	Per capita $
New South Wales							
Current outlays	12.0	98.0	14.0	56.0	171.0	351.0	
Capital outlays	—	21.0	73.0	2.0	373.0	469.0	
Total outlays	*12.0*	*119.0*	*87.0*	*58.0*	*544.0*	*820.0*	*136.7*
Victoria							
Current outlays	75.0	41.0	83.0	23.0	26.0	248.0	
Capital outlays	5.0	13.0	195.0	24.0	14.0	251.0	
Total outlays	*80.0*	*54.0*	*278.0*	*47.0*	*40.0*	*499.0*	*111.8*
Queensland							
Current outlays	—	—	(8.0)	12.0	33.0	38.0	
Capital outlays	—	—	87.0	28.0	70.0	186.0	
Total outlays	—	—	*79.0*	*40.0*	*103.0*	*224.0*	*71.9*
South Australia							
Current outlays	28.0	13.0	(3.0)	6.0	64.0	109.0	
Capital outlays	3.0	—	46.0	22.0	9.0	78.0	
Total outlays	*31.0*	*13.0*	*43.0*	*28.0*	*73.0*	*187.0*	*127.8*
Western Australia							
Current outlays	(51.0)	5.0	1.0	—	21.0	(24.0)	
Capital outlays	—	—	82.0	—	4.0	86.0	
Total outlays	*(51.0)*	*5.0*	*83.0*	—	*25.0*	*62.0*	*37.0*
Tasmania							
Current outlays	7.0	4.0	(1.0)	1.0	1.0	12.0	
Capital outlays	1.0	—	21.0	1.0	—	23.0	
Total outlays	*8.0*	*4.0*	*20.0*	*2.0*	*1.0*	*35.0*	*74.3*
Northern Territory							
Current outlays	1.0	—	(5.0)	—	7.0	4.0	
Capital outlays	—	—	2.0	—	—	2.0	
Total outlays	*1.0*	—	*(3.0)*	—	*7.0*	*6.0*	*35.4*
Australian Capital Territory							
Current outlays	—	—	7.0	—	—	7.0	
Capital outlays	—	—	4.0	—	—	4.0	
Total outlays	—	—	*11.0*	—	—	*11.0*	*36.8*
Australia(b)							
Current outlays	73.0	161.0	89.0	99.0	352.0	774.0	
Capital outlays	9.0	34.0	517.0	77.0	470.0	1 106.0	
Total outlays	*82.0*	*195.0*	*606.0*	*176.0*	*822.0*	*1 879.0*	*106.4*

(a) State figures include local government outlays.

(b) Includes Commonwealth outlays.

Note: Figures in parentheses represent negative outlays i.e. a net income was recorded for this item. Where figures have been rounded, discrepancies may occur between totals and the sums of the component items.

2.5 ENVIRONMENT PROTECTION OUTLAYS, By State—1993–94(a)

	GOVERNMENT PURPOSE CLASSIFICATION						
State/Territory	*Household garbage* $m	*Other sanitation* $m	*Sewerage* $m	*Urban stormwater drainage* $m	*Other* $m	*Total* $m	*Per capita* $
New South Wales							
Current outlays	(17.0)	88.0	43.0	27.0	173.0	312.0	
Capital outlays	—	11.0	83.0	4.0	219.0	316.0	
Total outlays	*(17.0)*	*99.0*	*126.0*	*31.0*	*392.0*	*628.0*	*103.8*
Victoria							
Current outlays	78.0	35.0	105.0	22.0	30.0	270.0	
Capital outlays	6.0	7.0	209.0	15.0	48.0	284.0	
Total outlays	*84.0*	*42.0*	*314.0*	*37.0*	*78.0*	*554.0*	*123.8*
Queensland							
Current outlays	—	—	(7.0)	13.0	48.0	54.0	
Capital outlays	—	—	111.0	28.0	37.0	175.0	
Total outlays	—	—	*104.0*	*41.0*	*85.0*	*229.0*	*71.6*
South Australia							
Current outlays	34.0	1.0	(5.0)	6.0	54.0	91.0	
Capital outlays	2.0	—	58.0	20.0	7.0	87.0	
Total outlays	*36.0*	*1.0*	*53.0*	*26.0*	*61.0*	*178.0*	*121.1*
Western Australia							
Current outlays	(61.0)	4.0	—	—	25.0	(31.0)	
Capital outlays	—	—	96.0	—	1.0	97.0	
Total outlays	*(61.0)*	*4.0*	*96.0*	—	*26.0*	*66.0*	*38.8*
Tasmania							
Current outlays	2.0	4.0	—	1.0	3.0	10.0	
Capital outlays	2.0	1.0	19.0	3.0	—	25.0	
Total outlays	*4.0*	*5.0*	*19.0*	*4.0*	*3.0*	*35.0*	*74.1*
Northern Territory							
Current outlays	2.0	—	1.0	—	10.0	13.0	
Capital outlays	—	—	1.0	—	—	1.0	
Total outlays	*2.0*	—	*2.0*	—	*10.0*	*14.0*	*81.8*
Australian Capital Territory							
Current outlays	—	—	7.0	—	—	7.0	
Capital outlays	—	—	14.0	—	—	14.0	
Total outlays	—	—	*21.0*	—	—	*21.0*	*69.8*
Australia(b)							
Current outlays	38.0	131.0	145.0	69.0	380.0	761.0	
Capital outlays	10.0	19.0	598.0	68.0	313.0	1 008.0	
Total outlays	*48.0*	*150.0*	*743.0*	*137.0*	*693.0*	*1 769.0*	*99.2*

(a) State figures include local government outlays.

(b) Includes Commonwealth outlays.

Note: Figures in parentheses represent negative outlays i.e. a net income was recorded for this item. Where figures have been rounded, discrepancies may occur between totals and the sums of the component items.

OTHER IDENTIFIED ENVIRONMENT PROTECTION EXPENDITURES

In addition to the predominantly water and waste environment protection outlays provided by the ABS Government Finance Statistics, other public sector environment protection expenditures such as soil and groundwater, and biodiversity and landscape protection, have been identified through other sources.

Tables 2.6 and 2.7 have been compiled from Commonwealth and State/Territory budget papers and, in some instances, departmental annual reports. Complete coverage would require inclusion of local governments and public sector non-budget agencies. In order to comply with an internationally recognised and common framework for the collection and presentation of economic data on the environment (SERIEE), the expenditures derived through this process have, where possible, been categorised according to the classification system underpinning this framework — CEPA. However, due to the varying budget presentations across States/Territories, identification of such expenditures is difficult and incomplete.

These expenditures are not directly comparable to the budget paper derived environment protection expenditures collected and presented for the 1991–92 financial year due to the differing frameworks used to classify the environmental expenditures identified.

Total environment protection expenditures identified through this process amounted to $1,073.5 million for 1992–93 and $1,172.1 million for 1993–94. Protection of biodiversity and landscape accounted for the highest proportion of these expenditures (53.0% and 54.0% in 1992–93 and 1993–94, respectively). The next largest expenditure fell in the 'other environment protection' category ($336.1 million in 1992–93 and $373.4 million in 1993–94). The majority of these expenditures relate to activities not able to be separately identified and allocated to each of the other categories.

Per capita expenditure on these identified expenditures increased from $61 per head in 1992–93 to $66 in 1993–94. The increase was greatest in New South Wales ($65 per head in 1992–93 and $76 in 1993–94). Per capita expenditures varied widely across States and Territories, with the Northern Territory ($249 in 1992–93 and $240 in 1993–94) and Tasmania ($90 in 1992–93 and $96 in 1993–94) recording the highest rates. Other per capita expenditures ranged from $25 (Victoria) to $65 (New South Wales) in 1992–93, and $25 (Victoria) to $76 (New South Wales) in 1993–94.

As budget papers and annual reports vary according to the level of detail at which expenditure data are presented, environment protection expenditures by State and expenditure category are a preliminary and partial estimate only and should be viewed with this in mind.

2.6 OTHER IDENTIFIED ENVIRONMENT PROTECTION EXPENDITURES—1992–93(a)

EXPENDITURE CLASSIFICATION

State/Territory	*Wastewater management/ water protection* $m	*Non-hazardous and hazardous waste management* $m	*Protection of soil and ground water* $m	*Protection of biodiversity and landscape* $m	*Protection of ambient air and climate* $m	*Noise and vibration abatement* $m	*Other environment protection* $m	*Total* $m	*Per capita* $
New South Wales									
Current expenditure	4.3	3.0	47.3	128.0	4.9	—	110.8	298.3	
Capital expenditure	—	21.4	1.0	39.1	1.7	—	29.3	92.5	
Total expenditure	*4.3*	*24.4*	*48.3*	*167.2*	*6.6*	—	*140.1*	*390.9*	*65.2*
Victoria									
Current expenditure	—	—	14.8	24.7	—	—	52.5	92.0	
Capital expenditure	0.2	—	9.2	11.0	—	—	0.1	20.5	
Total expenditure	*0.2*	—	*24.0*	*35.7*	—	—	*52.6*	*112.5*	*25.2*
Queensland									
Current expenditure	—	—	—	117.3	—	—	23.7	141.0	
Capital expenditure	0.3	1.1	3.5	17.6	—	—	2.3	24.8	
Total expenditure	*0.3*	*1.1*	*3.5*	*134.9*	—	—	*26.1*	*165.9*	*53.2*
South Australia									
Current expenditure	1.2	—	7.7	31.0	—	—	6.3	46.2	
Capital expenditure	.	—	0.4	2.0	—	—	0.6	3.0	
Total expenditure	*1.2*	—	*8.1*	*32.9*	—	—	*6.9*	*49.2*	*33.6*
Western Australia									
Current expenditure	5.7	—	0.1	46.8	0.8	—	14.7	68.1	
Capital expenditure	1.2	2.2	—	6.3	0.2	—	-	9.9	
Total expenditure	*6.9*	*2.2*	*0.1*	*53.2*	*1.0*	—	*14.7*	*78.0*	*46.5*
Tasmania									
Current expenditure	—	—	—	28.6	—	—	9.0	37.6	
Capital expenditure	—	—	—	4.6	—	—	0.2	4.8	
Total expenditure	—	—	—	*33.3*	—	—	*9.2*	*42.5*	*90.2*
Northern Territory									
Total expenditure	—	—	*1.7*	*40.5*	—	—	—	*42.1*	*248.7*
Australian Capital Territory									
Total expenditure	*6.6*	*0.2*	*1.3*	*1.7*	—	—	*0.9*	*10.6*	*35.5*
Commonwealth									
Current expenditure	—	10.3	11.8	64.2	—	—	85.6	171.9	
Capital expenditure	—	—	5.0	5.0	—	—	—	10.0	
Total expenditure	—	*10.3*	*16.7*	*69.2*	—	—	*85.6*	*181.8*	
Total	*19.4*	*38.2*	*103.7*	*568.6*	*7.6*	—	*336.1*	*1 073.5*	*60.8*

(a) Partial estimates only. Figures have been compiled from Commonwealth and State budget papers, and departmental annual reports. Where possible, attempts have been made to avoid double-counting with figures provided by ABS Government Finance Statistics (tables 2.3–2.5). As such, these figures represent additional expenditures to protect the environment.

2.7 OTHER IDENTIFIED ENVIRONMENT PROTECTION EXPENDITURES—1993–94(a)

	EXPENDITURE CLASSIFICATION								
State/Territory	*Wastewater management/ water protection* $m	*Non-hazardous and hazardous waste management* $m	*Protection of soil and ground water* $m	*Protection of biodiversity and landscape* $m	*Protection of ambient air and climate* $m	*Noise and vibration abatement* $m	*Other environment protection* $m	*Total* $m	*Per capita* $
New South Wales									
Current expenditure	5.6	2.3	68.2	152.0	4.8	0.4	147.3	380.6	
Capital expenditure	—	6.3	—	54.7	0.2	—	19.7	80.9	
Total expenditure	5.6	8.5	68.2	206.7	5.0	0.4	167.0	461.4	76.3
Victoria									
Current expenditure	—	—	2.3	41.8	—	—	54.1	98.2	
Capital expenditure	0.1	—	11.0	2.5	—	—	1.7	15.3	
Total expenditure	0.1	—	13.3	44.3	—	—	55.8	113.5	25.4
Queensland									
Current expenditure	—	—	0.2	126.3	—	—	20.1	146.6	
Capital expenditure	0.7	0.2	2.0	13.3	—	—	2.5	18.7	
Total expenditure	0.7	0.2	2.2	140.2	—	—	22.7	166.0	51.9
South Australia									
Current expenditure	3.6	—	—	43.5	—	—	6.6	53.7	
Capital expenditure	0.4	0.0	—	1.2	—	—	0.2	1.8	
Total expenditure	4.0	0.0	—	44.6	—	—	6.7	55.4	37.7
Western Australia									
Current expenditure	4.8	1.8	1.5	45.3	—	—	10.1	63.5	
Capital expenditure	0.2	0.6	—	5.0	—	—	1.8	7.6	
Total expenditure	5.0	2.4	1.5	50.4	—	—	11.9	71.1	41.8
Tasmania									
Current expenditure	—	—	8.9	22.1	—	—	9.9	40.9	
Capital expenditure	—	—	—	2.7	—	—	1.7	4.4	
Total expenditure	—	—	8.9	24.8	—	—	11.5	45.2	95.7
Northern Territory									
Total expenditure	—	—	4.9	36.3	—	—	—	41.1	240.3
Australian Capital Territory									
Total expenditure	6.0	0.3	1.0	2.3	0.0	0.0	1.4	11.2	37.1
Commonwealth									
Current expenditure	—	14.8	5.6	78.6	1.6	—	96.4	197.0	
Capital expenditure	—	—	4.9	5.2	—	—	—	10.1	
Total expenditure	—	14.8	10.6	83.8	1.6	—	96.4	207.2	
Total	21.5	26.2	110.6	633.4	6.6	0.4	373.4	1 172.1	65.7

(a) Partial estimates only. Figures have been compiled from Commonwealth and State budget papers, and departmental annual reports. Where possible, attempts have been made to avoid double-counting with figures provided by ABS Government Finance Statistics (tables 2.3–2.5). As such, these figures represent additional expenditures to protect the environment.

ELECTRICITY AND GAS UTILITIES

In 1992–93 and 1993–94, electricity and gas utilities were asked to indicate capital and current environment protection expenditures. This data was collected through the ABS Census of Utilities, and represents additional public sector expenditure on environment protection measures not identified through ABS finance statistics or budget papers.

Total expenditure on current and capital environment protection measures amounted to $167.7 million in 1992–93 and $136.6 million in 1993–94 (table 2.8). The majority of these expenditures were by electricity utilities (99% in 1992–93 and 89% in 1993–94).

2.8 ELECTRICITY AND GAS UTILITIES EXPENDITURES

Sector	*Current* $m	*Capital* $m	*Total* $m
	1992–93		
Electricity utilities	85.5	80.5	166.0
Gas utilities	1.3	0.5	1.8
Total	*86.8*	*80.9*	*167.7*
	1993–94		
Electricity utilities	64.6	56.9	121.6
Gas utilities	15.1	0.0	15.1
Total	*79.7*	*56.9*	*136.6*

Table 2.9 provides a breakdown of current expenditure by electricity and gas utilities into its various components. The majority of pollution abatement and control current expenditure was on 'other' expenditure (54% of total current expenditure on environment protection in 1992–93 and 67% in 1993–94). This includes estimates for labour, materials, electricity and fuels on environment protection activities.

Environment protection expenditure on air pollutants was the largest capital expenditure by electricity and gas utilities for both years ($46.6 million in 1992–93 and $34.4 million in 1993–94) (table 2.10). Overall, expenditure was down for all environment protection activities by electricity utilities in 1993–94, although current expenditure on environment protection by gas utilities increased over the two-year period ($1.3 million in 1992–93 and $15.1 million in 1993–94).

2.9 COMPONENTS OF ENVIRONMENT PROTECTION CURRENT EXPENDITURE

Electricity and gas	Govt fees, charges and taxes	Purchased services	Intramural R&D	Extramural R&D	Other	Total
	$m	$m	$m	$m	$m	$m
			1992–93			
Total	10.2	21.7	4.9	3.5	46.6	86.8
			1993–94			
Total	3.0	15.6	3.9	3.7	53.5	79.7

2.10 COMPONENTS OF ENVIRONMENT PROTECTION CAPITAL EXPENDITURE

Electricity and gas	Water protection	Solid waste (haz. and non-haz.)	Air protection	Noise abatement	Other	Total
	$m	$m	$m	$m	$m	$m
			1992–93			
Total	14.5	5.2	46.6	0.3	14.3	80.9
			1993–94			
Total	10.2	1.3	34.4	0.4	10.6	56.9

CHAPTER 3 AGRICULTURE INDUSTRY

INTRODUCTION

Environment protection expenditure estimates for the agriculture industry were compiled from a sample of farm businesses for the 1992–93 and 1993–94 financial years. As a result the estimates are subject to sampling variability with, in some cases, high relative standard errors.

Environment protection expenditure presented here for the agriculture industry does not distinguish between pollution abatement and other environment protection expenditures. The current approach is to provide a single aggregate for all environment protection expenditures.

The inclusion of certain categories as environment protection expenditures is consistent with their inclusion as part of the Commonwealth Government's taxation concessions to assist landholders to undertake landcare activities. Some of the data therefore specifically relate to expenditure on measures to control and/or prevent land degradation.

Costs incurred to prepare and implement a whole farm plan (with the aim of better environmental management), and expenses for self-education on issues mainly concerning land care were also collected. These other expenditures by no means capture all costs incurred by the farm businesses on environment protection.

OVERVIEW OF RESULTS

Table 3.1 provides an overview of the environment protection expenditures of the agriculture industry. Taking into account some grants and subsidies to farm businesses, the known environment protection expenditures by the agriculture industry were $96.3 million for 1992–93 and $112.1 million for 1993–94.

The major component of expenditure was for the control and/or prevention of land degradation, with small percentages expended on self-education and preparing farm plans (4.3% and 5.0% in 1992–93 and 1993–94, respectively).

3.1 AGRICULTURE ENVIRONMENT PROTECTION EXPENDITURE

	1991–92	*1992–93*	*1993–94*
Expenditure	$m	$m	$m
Preventing/controlling land degradation	180.0	145.4	168.8
Other environment protection expenditures	5.9	6.5	8.8
Total	*185.9*	*151.9*	*177.6*
Minus environmental grants and subsidies received(a)	35.7	55.6	65.5
Net environment protection expenditures	*150.2*	*96.3*	*112.1*

(a) This figure is deducted to ensure there is no double counting in the final estimates for expenditures for all Australian industry and government. The figure is included on the public sector side of the equation.

EXPENDITURE TO PREVENT/CONTROL LAND DEGRADATION

Table 3.2 shows the amounts reported by farm businesses on specific measures to prevent/control land degradation in Australia for 1992–93 and 1993–94. The total expenditure for these activities were $145.4 million for 1992–93 and $168.8 million for 1993–94, representing 0.7% and 0.8% of agriculture industry turnover for 1992–93 and 1993–94, respectively.

The main component of expenditure was consistently reported as being spent on eradication or extermination of animals or insects and destruction of weed or plant growth detrimental to the land ($68.3 million in 1992–93 and $72.2 million in 1993–94).

The next highest expenditure was on earthworks to control, treat or prevent erosion, salinity or waterlogging ($50.4 million or 35% of expenditure to prevent/control land degradation for 1992–93 and $68.9 million or 41% in 1993–94). These expenditures included gully stabilisation, grassed walkways, contour banking, dams for the explicit purpose of treating/preventing land degradation, as well as land levelling and grading. These last two practices may not be solely for 'landcare' purposes in certain industries such as vegetable, sugarcane and cotton production, where land levelling and grading constitute normal farming practices. Therefore, expenditure on this item may be overestimated.

3.2 ENVIRONMENT PROTECTION EXPENDITURE, By State and Component—1992–93 and 1993–94

Description	NSW	Vic.	Qld	SA	WA	Tas.	Aust.(a)
	$m	$m	$m	$m	$m	$m	$m
	1992–93						
Preventing /controlling land degradation							
Eradication or extermination of animals or insects and destruction of weeds or plant growth detrimental to the land	22.7	8.7	21.3	6.8	4.6	2.3	68.3
Earthworks to control, treat or prevent erosion, salinity or water logging	13.1	9.8	19.2	1.0	5.1	1.6	50.4
Tree or shrub establishment/protection to control/prevent land degradation	2.5	1.9	0.7	0.5	3.4	0.3	9.5
Erection of fences to separate different land classes to prevent land degradation and/or to exclude livestock or vermin from areas affected by land degradation	2.4	4.4	1.8	1.6	5.6	0.9	17.2
Total	*40.7*	*24.7*	*43.0*	*9.9*	*18.8*	*5.1*	*145.4*
Costs incurred to prepare farm plan	0.5	1.2	0.4	0.1	0.6	0.1	3.0
Expenses for self-education	1.1	0.3	0.8	0.6	0.7	0.1	3.5
Total	*42.4*	*26.2*	*44.2*	*10.7*	*20.1*	*5.3*	*151.9*
	1993–94						
Preventing /controlling land degradation							
Eradication or extermination of animals or insects and destruction of weeds or plant growth detrimental to the land	15.5	11.4	30.9	7.1	4.1	2.5	72.2
Earthworks to control, treat or prevent erosion, salinity or water logging	26.1	11.7	18.7	3.5	7.8	1.1	68.9
Tree or shrub establishment/protection to control/prevent land degradation	2.3	3.6	1.0	0.7	3.6	0.4	11.7
Erection of fences to separate different land classes to prevent land degradation and/or to exclude livestock or vermin from areas affected by land degradation	3.4	1.7	1.4	1.4	6.5	0.9	15.9
Total	*47.3*	*28.4*	*52.0*	*12.7*	*22.0*	*4.9*	*168.8*
Costs incurred to prepare farm plan	2.7	0.7	1.0	0.5	0.6	0.1	5.5
Expenses for self-education	0.8	0.5	0.8	0.4	0.6	0.1	3.3
Total	*50.8*	*29.7*	*53.8*	*13.6*	*23.1*	*5.1*	*177.6*

(a) Australian total includes figures for the Northern Territory and the Australian Capital Territory.

The agricultural sector spent $17.2 million in 1992–93 and $15.9 million in 1993–94 on the erection of fences to control/prevent land degradation. This included expenditures on alterations, extensions and additions to existing fences for the purpose of excluding land livestock or vermin to assist in repairing or controlling existing land degradation. This item may be understated as much of this expenditure would be reported as 'repairs and maintenance' for tax purposes.

Expenditure on tree or shrub establishment primarily to prevent or combat land degradation amounted to $9.5 million (6.5% of total) in 1992–93 and $11.7 million (6.9% of total) in 1993–94. This amount relates to costs associated with the planting/protection of plants to control salinity, stabilise erosion gullies and establishing windbreaks to prevent soil erosion.

These statistics represent further development in estimates of environment protection expenditures for the agriculture industry, with the common purpose of these activities being explicitly the prevention/control of land degradation. For a more complete coverage of environment protection expenditures, further costs of activities such as waste/effluent disposal of intensive enterprises, and the improvement of drainage and infrastructure for the prevention/control of irrigation salinity, should be captured.

In 1992–93, Queensland spent the most in absolute terms on controlling/preventing land degradation ($43.0 million or 29.6% of total) and Tasmania spent the most as a percentage of the State's total agricultural turnover (nearly 1.0%) . For 1993–94, Queensland spent the most on controlling/preventing land degradation, both as a total ($52.0 million or 30.8% of total) and as a percentage of the State's total agricultural turnover (1.0%).

EXPENDITURE BY INDUSTRY CLASS

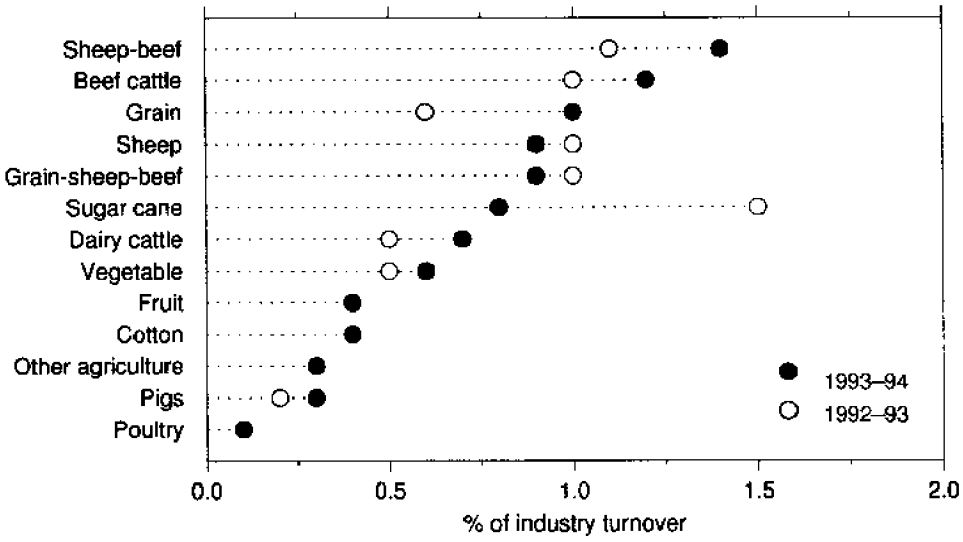
Table 3.3 shows expenditure on environment protection by industry class. The highest expenditure on environment protection was reported by the Grain-sheep, grain-beef cattle farming industry in 1992–93 ($35.1 million or 23.1% of total), and by the Beef cattle farming industry in 1993–94 ($37.6 million or 21.2% of total). Other major contributors to environment protection expenditure were, for 1992–93, the Beef cattle industry ($24.9 million or 16.4% of total), and for 1993–94, the Grain growing industry ($35.7 million or 20.1% of total).

The highest proportion of expenditure on environment protection to industry turnover for 1992–93 was in the sugar cane growing industry (spending 1.5% of industry turnover) (graph 3.4). Sugar cane growing accounted for 8.2% of environment protection expenditure by the agriculture industry, comprising mainly earthworks to control salinity or erosion. The next highest proportion was for the Sheep-beef cattle farming industry, with 1.1% of industry turnover being spent. This industry spent the highest proportion of expenditure on environment protection (1.4% of industry turnover) in 1993–94, comprising mainly eradication of animals, insects and detrimental plant growth. The next highest proportion was for the Beef cattle farming industry (1.2%).

3.3 ENVIRONMENT PROTECTION EXPENDITURE, By Industry—1992–93 and 1993–94

ANZSIC code	Industry	Land degradation protection/prevention... $m	Land degradation protection/prevention... % of total industry turnover	Farm plan & self education $m	Total environment protection expenditure.... $m	Total environment protection expenditure.... % of total industry turnover
		1992–93				
014	Poultry farming	0.4	0.1	0.0	0.4	0.1
0114–0119	Fruit growing	6.1	0.4	0.2	6.3	0.4
0113	Vegetable growing	5.1	0.5	0.2	5.3	0.5
0121	Grain growing	14.5	0.6	1.2	15.8	0.6
0122	Grain-sheep, grain-beef cattle farming	33.7	1.0	1.4	35.1	1.0
0123	Sheep-beef cattle farming	13.4	1.0	0.4	13.8	1.1
0124	Sheep farming	16.1	1.0	0.8	16.8	1.0
0125	Beef cattle farming	24.0	1.0	0.9	24.9	1.0
0130	Dairy cattle farming	12.5	0.5	1.0	13.5	0.5
0151	Pig farming	0.9	0.2	0.1	1.0	0.2
0161	Sugar cane growing	12.3	1.4	0.1	12.5	1.5
0162	Cotton growing	3.8	0.4	0.1	3.9	0.4
0152, 0153, 0159, 0169	Other agriculture	2.5	0.3	0.2	2.7	0.3
	All industries	*145.4*	*0.7*	*6.5*	*151.9*	*0.8*
		1993–94				
014	Poultry farming	0.6	0.1	0.1	0.7	0.1
0114–0119	Fruit growing	5.6	0.4	0.5	6.1	0.4
0113	Vegetable growing	6.7	0.6	0.1	6.9	0.6
0121	Grain growing	33.6	1.0	2.1	35.7	1.0
0122	Grain-sheep, grain-beef cattle farming	23.8	0.8	3.0	26.8	0.9
0123	Sheep-beef cattle farming	17.2	1.3	0.5	17.7	1.4
0124	Sheep farming	11.2	0.9	0.6	11.8	0.9
0125	Beef cattle farming	36.7	1.2	0.8	37.6	1.2
0130	Dairy cattle farming	16.7	0.6	0.3	17.0	0.7
0151	Pig farming	1.7	0.2	0.1	1.8	0.3
0161	Sugar cane growing	8.6	0.8	0.1	8.7	0.8
0162	Cotton growing	3.2	0.4	0.2	3.4	0.4
0152, 0153, 0159, 0169	Other agriculture	3.2	0.3	0.3	3.5	0.3
	All industries	*168.8*	*0.8*	*8.8*	*177.6*	*0.8*

3.4 ENVIRONMENT PROTECTION EXPENDITURE, Percentage of Industry Total



GRANTS AND SUBSIDIES

The survey estimates in table 3.5 are subject to comparatively high standard errors and the following comments should be interpreted in this light.

New South Wales farm businesses received 40.5% ($4.5 million) of the total soil conservation grants/subsidies reported by the farm businesses in 1992–93. This amounted to 10.6% of total expenditure by the agriculture industry in New South Wales. Victoria ($3.8 million) and Western Australia ($2.0 million) received the next highest total of grants for soil conservation, with these amounts comprising 14.5% and 10.0% respectively of this sector's expenditure on environment protection activities in these States.

Victorian farm businesses received 30.5% ($1.8 million) of the total soil conservation grants/subsidies reported in 1993–94. Western Australia ($1.5 million), New South Wales ($1.4 million) and South Australia ($0.8 million) received the next most significant grants for soil conservation, with these amounts comprising 6.5%, 2.8% and 5.9% respectively of this sector's expenditure on environment protection activities in these States.

Total natural disaster grants/subsidies amounted to $44.5 million in 1992–93 and $59.6 million in 1993–94. Queensland and New South Wales received the most natural disaster grants ($23.2 million and $16.0 million respectively for 1992–93, and $34.9 million and $12.5 million respectively for 1993–94). These grants and subsidies may be spent on a range of preventative and rehabilitative measures, both economic and environmental. The total of these amounts does not necessarily entirely relate to measures used to protect the environment.

3.5 GRANTS AND SUBSIDIES RECEIVED, By State—1992–93 and 1993–94

Description	NSW	Vic.	Qld	SA	WA	Tas.	Aust.(a)
	$m	$m	$m	$m	$m	$m	$m
			1992–93				
Soil conservation grants and subsidies	4.5	3.8	0.6	0.1	2.0	0.0	11.1
Natural disaster grants	16.0	0.7	23.2	4.4	0.0	0.1	44.5
			1993–94				
Soil conservation grants and subsidies	1.4	1.8	0.3	0.8	1.5	0.1	5.9
Natural disaster grants	12.5	1.1	34.9	6.5	4.5	0.1	59.6

(a) Australian total includes figures for the Northern Territory and the Australian Capital Territory.

CHAPTER 4 MINING INDUSTRY

INTRODUCTION

For the 1992–93 and 1993–94 financial years, mining businesses were asked questions on their total expenditure on pollution abatement and control measures. These included: capital and current expenditure on environment protection, and research and development expenditure on environment protection.

Capital expenditure on environment protection in the mining industry was defined as: expenditure on any element of the production processes specifically concerned with protecting the environment by reduction or elimination of pollutants and wastes. This could be either by remedial (end-of-line) or by preventative (change-in-production) measures. The former refers to the cost of treating pollutants after they have been produced by installing distinct abatement and control facilities; expenses to remove and dispose of wastes; construction of civil works and/or facilities to recreate ecosystems by ripping compacted surfaces or revegetation. Change-in-production, on the other hand, reduces or eliminates the production of pollution by preventing its occurrence. This can be achieved by improved mining techniques or equipment alteration including equipment converted to use fuels that generate less pollutants.

Capital expenditure on environment protection has been sought over a number of domains. These domains are protection of water, non-hazardous waste, hazardous waste, protection of air, noise abatement, land rehabilitation and other pollution abatement.

Current expenditure on environment protection in the mining industry was defined as: expenditure to operate or maintain plant and equipment to abate pollution; payments to contractors to remove and dispose of waste; costs associated with wind and water erosion; on-going site rehabilitation; regular sampling tests, and related research and development expenditure.

OVERVIEW OF RESULTS

In 1992–93, total pollution abatement and control expenditure in the mining industry was $144.0 million (table 4.1). Current expenditure accounted for 66.5% of total pollution abatement expenditure. For the 1993–94 financial year, total pollution abatement and control expenditure in the mining industry was $185.9 million. Current expenditure accounted for 69.3% of total pollution abatement expenditure. More detailed data are presented throughout the remainder of this chapter.

4.1 MINING SECTOR ENVIRONMENT PROTECTION EXPENDITURES

	1992–93	*1993–94*
	$m	$m
Pollution abatement and control		
Capital expenditure	48.3	57.1
Current expenditure	95.7	128.2
Total environment protection expenditure(a)	**144.0**	**185.9**

(a) Expenditures by the mining sector on environmental expenditures not related to pollution abatement and control have yet to be investigated. Hence this figure is comprised entirely of pollution abatement expenditures.

POLLUTION ABATEMENT AND CONTROL

By industry

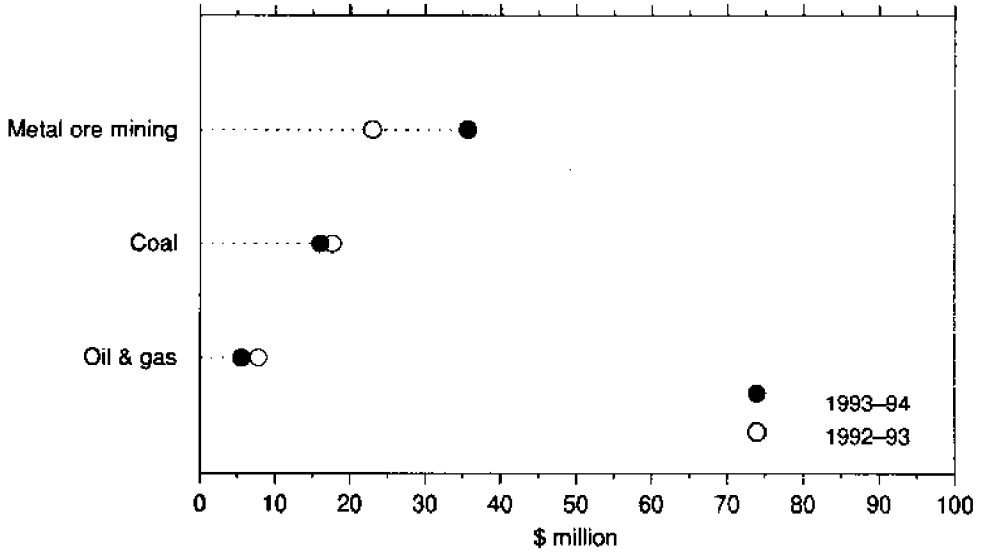
Highest total pollution abatement and control expenditure was recorded by the non-ferrous metals ($66.5 million in 1992–93 and $71.4 million in 1993–94) and coal mining ($58.2 million in 1992–93 and $64.4 million in 1993–94) industries (table 4.2). Within the non-ferrous metals category (ANZSIC codes 1312–1319), the gold ore mining industry expended the most on environment protection ($26.3 million in 1992–93 and $30.1 million in 1993–94). Graphs 4.3 and 4.4 present a breakdown of capital and current expenditure by industry groups.

A substantial portion (76.1% in 1992–93 and 76.7% in 1993–94) of current expenditure is in the 'other' category (table 4.5). This category includes the cost of mine site rehabilitation which is a significant environmental remediation measure undertaken by mining businesses. This table also illustrates the propensity of mining businesses to do their own research and development rather than contracting it out.

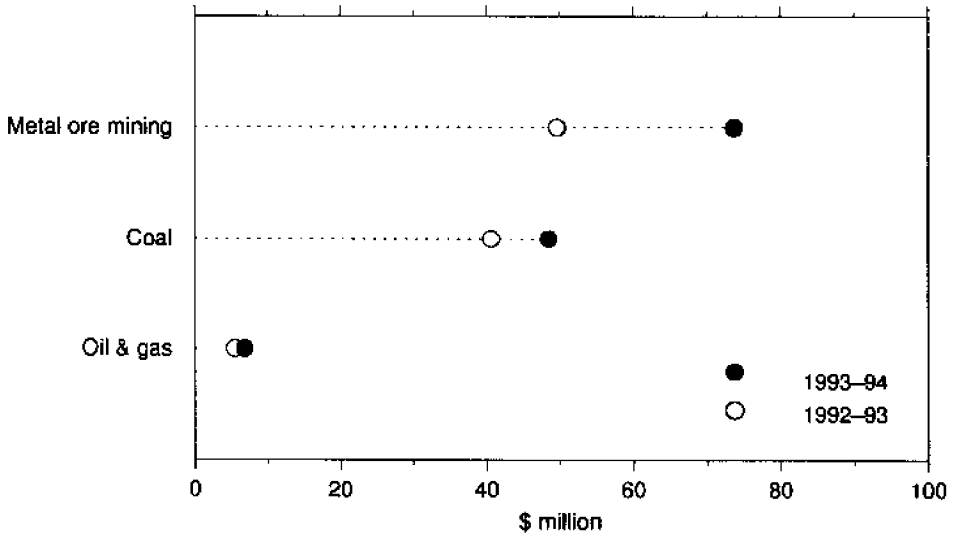
4.2 ENVIRONMENT PROTECTION EXPENDITURE, By Mining Industry, 1992–93 and 1993–94

		Capital		Current		Total	
ANZSIC code	Industry	no.	$m	no.	$m	no.	$m
	1992–93						
110	Coal mining	27	17.6	64	40.6	111	58.2
120	Oil and gas extraction	4	7.8	8	5.5	52	13.4
131	Metal ore mining						
1311	Iron ore mining (ferrous metals)	5	3.5	8	2.5	14	6.0
1312	Bauxite mining	3	n.p.	3	n.p.	6	6.2
1313	Copper ore mining	3	n.p.	10	n.p.	13	6.2
1314	Gold ore mining	17	7.5	64	18.8	142	26.3
1315	Mineral sand mining	5	2.9	10	10.1	15	12.9
1316	Nickel ore mining	1	n.p.	4	n.p.	7	4.0
1317	Silver-lead-zinc ore mining	6	3.1	10	3.9	14	7.1
1319	Metal ore mining n.e.c.	1	n.p.	5	n.p.	8	3.9
Total		*41*	*22.9*	*114*	*49.6*	*219*	*72.5*
Total		*72*	*48.3*	*186*	*95.7*	*382*	*144.0*
	1993–94						
110	Coal mining	22	16.0	67	48.4	108	64.4
120	Oil and gas extraction	4	5.6	13	6.8	40	12.4
131	Metal ore mining						
1311	Iron ore mining (ferrous metals)	5	n.p.	9	n.p.	13	37.4
1312	Bauxite mining	2	n.p.	2	n.p.	5	6.2
1313	Copper ore mining	4	n.p.	12	n.p.	14	8.6
1314	Gold ore mining	22	9.1	73	21.2	144	30.1
1315	Mineral sand mining	4	2.3	11	14.9	15	17.2
1316	Nickel ore mining	—	—	3	n.p.	8	n.p.
1317	Silver-lead-zinc ore mining	5	2.5	9	2.8	13	5.3
1319	Metal ore mining n.e.c.	1	n.p.	5	1.9	9	n.p.
Total		*43*	*35.5*	*124*	*73.6*	*221*	*108.8*
Total		*69*	*57.1*	*204*	*128.8*	*369*	*185.9*

4.3 MINING INDUSTRY ENVIRONMENT PROTECTION, Capital Expenditure



4.4 MINING INDUSTRY ENVIRONMENT PROTECTION, Current Expenditure



4.5 COMPONENTS OF CURRENT EXPENDITURE ON ENVIRONMENT PROTECTION, By Industry

		Payments to governments		*Payments to non-governments*		*Other costs*		*Intramural R&D*		*Extramural R&D*		*Total*
ANZSIC code	*Description*	no.	$m	no.	$m	no.	$m	no.	$m	no.	$m	$m
						1992–93						
110	Coal mining	23	n.p.	25	4.7	54	31.5	9	2.9	7	n.p.	40.6
120	Oil and gas extraction	4	n.p.	5	1.0	7	3.8	2	n.p.	1	n.p.	5.5
131	Metal ore mining	19	n.p.	32	8.7	106	37.5	12	n.p.	6	0.3	49.6
Total		*46*	*1.3*	*62*	*14.4*	*167*	*72.8*	*23*	*5.7*	*14*	*1.5*	*95.7*
						1993–94						
110	Coal mining	28	7.1	30	5.5	51	34.3	8	n.p.	5	n.p.	48.4
120	Oil and gas extraction	6	n.p.	6	1.4	11	4.8	2	n.p.	1	n.p.	6.8
131	Metal ore mining	25	n.p.	29	6.9	112	59.8	19	3.2	8	n.p.	73.6
Total		*59*	*8.4*	*65*	*13.8*	*174*	*98.8*	*29*	*4.8*	*14*	*3.0*	*128.8*

Note: Where figures have been rounded, discrepancies may occur between totals and sums of component items.

By State

Tables 4.6 and 4.7 show current and capital expenditure on pollution abatement and control by State. In 1992–93 Queensland accounted for 44.5% ($42.6 million) of current expenditure, whilst Western Australia amounted to 41.0% ($52.8 million) in 1993–94. The increase in current expenditure for Western Australia stemmed from a rise in expenses for Metal ore mining between 1992–93 and 1993–94.

Western Australia accounted for 40.0% ($19.3 million) of capital expenditure in 1992–93 and 52.4% ($29.9 million) in 1993–94. The majority of capital expenditure for Western Australia was provided by Metal ore mining industries ($13.4 million for 1992–93, and $23.3 million for 1993–94).

By technique

Table 4.8 separates total capital expenditure on pollution abatement and control into two elements: end-of-line and change-in-production. End-of-line techniques account for 90.9% (1992–93) and 89.8% (1993–94) of capital expenditure. This is probably due to the fact that end-of-line measures are most appropriate for mining activity. The ability to accurately report change-in-production specifically attributable to environmental protection is problematic as this may be undertaken for other reasons, including cost savings.

4.6 CURRENT EXPENDITURE ON ENVIRONMENT PROTECTION, By Industry and State

ANZSIC code	Description	NSW no.	NSW $m	Vic. no.	Vic. $m	Qld no.	Qld $m	SA no.	SA $m	WA no.	WA $m	Tas. no.	Tas. $m	NT no.	NT $m	Aust. no.	Aust. $m
							1992–93										
110	Coal mining	43	13.9	—	—	17	25.6	1	n.p.	1	n.p.	2	n.p.	—	—	64	40.6
120	Oil and gas extraction	—	—	1	n.p.	1	n.p.	2	n.p.	4	n.p.	—	—	—	—	8	5.5
131	Metal ore mining	9	3.7	7	n.p.	24	n.p.	3	n.p.	57	18.9	5	n.p.	9	7.1	114	49.6
Total		*52*	*17.6*	*8*	*1.5*	*42*	*42.6*	*6*	*1.9*	*62*	*23.1*	*7*	*1.8*	*9*	*7.1*	*186*	*95.7*
							1993–94										
110	Coal mining	39	12.2	5	8.2	20	27.1	1	n.p.	2	n.p.	—	—	—	—	67	48.4
120	Oil and gas extraction	—	—	2	n.p.	3	n.p.	2	n.p.	6	n.p.	—	—	—	—	13	6.8
131	Metal ore mining	10	4.0	9	n.p.	19	n.p.	3	n.p.	70	47.6	6	2.2	7	5.4	124	73.6
Total		*49*	*16.2*	*16*	*9.2*	*42*	*40.2*	*6*	*2.7*	*78*	*52.8*	*6*	*2.2*	*7*	*5.4*	*204*	*128.8*

4.7 CAPITAL EXPENDITURE ON ENVIRONMENT PROTECTION, By Industry and State

ANZSIC code	Description	NSW no.	NSW $m	Vic. no.	Vic. $m	Qld no.	Qld $m	SA no.	SA $m	WA no.	WA $m	Tas. no.	Tas. $m	NT no.	NT $m	Aust. no.	Aust. $m
							1992–93										
110	Coal mining	20	n.p.	—	—	4	11.1	1	n.p.	1	n.p.	1	n.p.	—	—	27	17.6
120	Oil and gas extraction	—	—	1	n.p.	—	—	1	n.p.	2	n.p.	—	—	—	—	4	7.8
131	Metal ore mining	2	n.p.	3	n.p.	11	5.6	1	n.p.	21	13.4	1	n.p.	2	n.p.	41	22.9
Total		*22*	*6.5*	*4*	*3.7*	*15*	*16.7*	*3*	*0.3*	*24*	*19.3*	*2*	*n.p.*	*2*	*n.p.*	*72*	*48.3*
							1993–94										
110	Coal mining	12	n.p.	1	n.p.	7	9.4	1	n.p.	1	n.p.	—	—	—	—	22	16.0
120	Oil and gas extraction	—	—	1	n.p.	—	—	1	n.p.	2	n.p.	—	—	—	—	4	5.6
131	Metal ore mining	4	n.p.	2	n.p.	10	5.4	—	—	24	23.3	—	—	3	4.7	43	35.6
Total		*16*	*6.2*	*4*	*n.p.*	*17*	*14.8*	*2*	*n.p.*	*27*	*29.9*	—	—	*3*	*4.7*	*69*	*57.1*

4.8 CAPITAL EXPENDITURE ON ENVIRONMENT PROTECTION, By Technique

ANZSIC code	Description	End-of-line $m	Change-in production $m	Total $m
		1992–93		
110	Coal mining	14.2	3.4	17.6
120	Oil and gas extraction	7.7	0.1	7.8
131	Metal ore mining	22.0	0.9	22.9
Total		*43.9*	*4.5*	*48.3*
		1993–94		
110	Coal mining	13.6	2.4	16.0
120	Oil and gas extraction	5.1	0.4	5.6
131	Metal ore mining	32.6	2.9	35.6
Total		*51.3*	*5.7*	*57.1*

Note: Where figures have been rounded, discrepancies may occur within totals.

By environmental domain

Measures to abate water pollution accounted for 36.4% of capital expenditure ($17.6 million) for the 1992–93 year (table 4.9). In 1993–94, spending on land rehabilitation accounted for 35.9% ($20.5 million) compared with 30.4% ($14.7 million) in 1992–93. For the 1993–94 financial year, measures to abate air pollution amounted to 28.0% ($16.0 million) of total expenditure and measures to abate water pollution accounted for 24.7% ($14.1 million).

COMPARISON OF 1991–1994 DATA

Graph 4.10 and table 4.11 compare mining industry environment protection expenditure over the period 1991–92 to 1993–94 at constant prices. An overall increase of 22.5% on pollution abatement and control expenditure has occurred between 1991–92 and 1993–94. The constant price index for the mining sector (base period 1989–90) was used to produce the constant price estimates of environment protection expenditure. The constant prices for the mining sector can be found in *Australian National Accounts — National Income and Expenditure* (5204.0).

The constant price estimates for the period 1991–92 to 1992–93 show a 5.1% reduction in expenditure, whereas the period 1992–93 to 1993–94 shows an increase of 29.1%. The increase in expenditure for 1993–94 is due to the sharp rise in current expenditure for pollution abatement and control, an increase of 34.6%. Values for expenditure on environmental impact assessments, environmental audits and energy audits were not part of the collection framework for 1992–93.

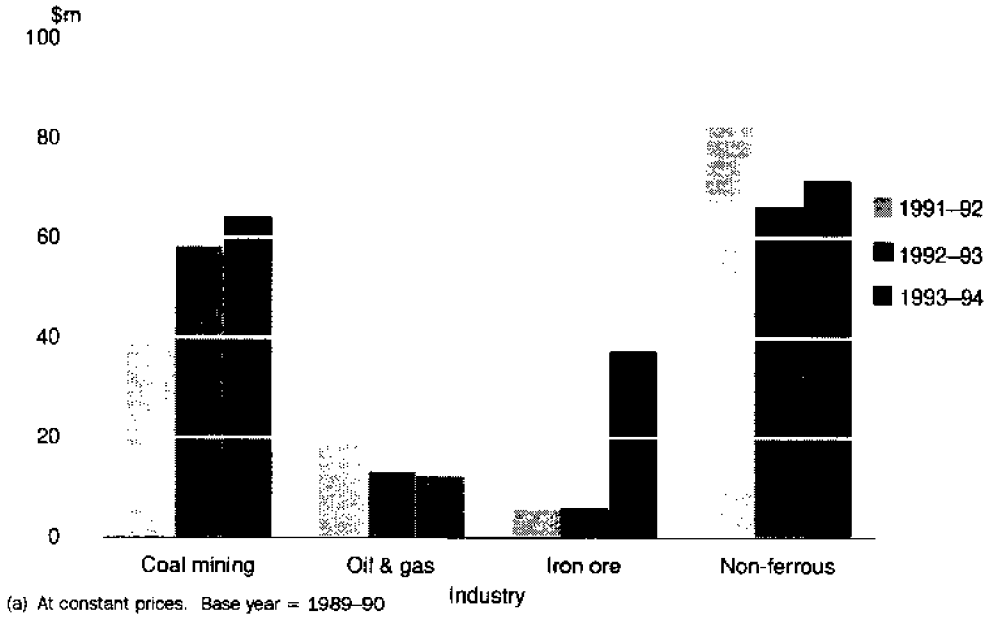
The figures for the 1992–93 and 1993–94 financial years differ from those produced in *Mining Industry, Australia, 1992–93* and *Mining Industry, Australia, 1993–94* (8402.0). The current publication (4603.0) includes research and development as a component of current expenditure.

4.9 CAPITAL EXPENDITURE ON ENVIRONMENT PROTECTION, By Environmental Domain

		Land rehabilitation		*Water protection*		*Solid non-hazardous waste*		*Solid hazardous waste*		*Air protection*		*Noise abatement*		*Total*
ANZSIC code	*Description*	no.	$m	no.	$m	no.	$m	no.	$m	no.	$m	no.	$m	$m
						1992–93								
110	Coal mining	14	n.p.	22	6.5	6	n.p.	2	n.p.	11	2.2	10	0.3	17.6
120	Oil and gas extraction	3	n.p.	3	4.1	1	n.p.	2	n.p.	3	1.4	—	—	7.8
131	Metal ore mining	24	7.9	23	7.0	11	2.9	11	2.3	14	2.6	8	0.3	22.9
Total		*41*	*14.7*	*48*	*17.6*	*18*	*6.4*	*15*	*2.8*	*28*	*6.3*	*18*	*0.6*	*48.3*
						1993–94								
110	Coal mining	12	9.5	18	n.p.	4	n.p.	4	n.p.	7	n.p.	—	—	16.0
120	Oil and gas extraction	4	1.0	4	n.p.	2	n.p.	2	n.p.	4	n.p.	—	—	5.6
131	Metal ore mining	27	10.1	27	6.5	10	1.9	9	3.1	21	13.7	9	0.3	35.5
Total		*43*	*20.5*	*49*	*14.1*	*16*	*2.9*	*15*	*3.4*	*32*	*16.0*	*9*	*0.3*	*57.1*

Note: Where figures have been rounded, discrepancies may occur between totals and sums of component items.

4.10 ENVIRONMENT PROTECTION EXPENDITURE(a)—1991–92 to 1993–94



(a) At constant prices. Base year = 1989–90

4.11 ENVIRONMENT PROTECTION EXPENDITURE(a)—1991–92 to 1993–94

		Capital.....		Current.....		Total
ANZSIC code	Description	no.	$m	no.	$m	$m
		1991–92				
110	Coal mining	31	15.0	64	29.4	44.3
120	Oil and gas extraction	5	9.7	9	9.6	19.3
1311	Iron ore mining (ferrous metals)	3	3.8	6	1.8	5.6
1312–1319	Total non-ferrous metals	46	25.0	109	57.4	82.4
Total		*85*	*53.4*	*188*	*98.3*	*151.7*
		1992–93				
110	Coal mining	27	17.6	64	40.6	58.2
120	Oil and gas extraction	4	7.8	8	5.5	13.4
1311	Iron ore mining (ferrous metals)	5	3.5	8	2.5	6.0
1312–1319	Total non-ferrous metals	36	19.4	106	47.1	66.5
Total		*72*	*48.3*	*186*	*95.7*	*144.0*
		1993–94				
110	Coal mining	22	16.0	67	48.4	64.4
120	Oil and gas extraction	4	5.6	13	6.8	12.4
1311	Iron ore mining (ferrous metals)	5	16.5	9	20.9	37.4
1312–1319	Total non-ferrous metals	38	19.1	115	52.7	71.7
Total		*69*	*57.1*	*204*	*128.8*	*185.9*

(a) At constant prices. Base year = 1989–90.

CHAPTER 5 MANUFACTURING INDUSTRIES

INTRODUCTION

For the 1992–93 and 1993–94 financial years, questions on pollution abatement and control were included in a survey to all subdivisions of manufacturers. In 1993–94, the data collection methodology changed such that expenditure by State was not collected.

Capital expenditure on pollution abatement and control in the manufacturing sector is defined as 'expenditure on any element of the production processes specifically attributable to protecting the environment by reduction or elimination of pollutants and wastes'. Expenditure was classified according to environmental protection activities relating to water protection, air protection, hazardous and non-hazardous solid wastes, noise abatement, and 'other' protection. Current expenditure on pollution abatement and control is defined as 'payments for waste removal and other pollution measurements and controls'.

OVERVIEW OF RESULTS

For the manufacturing sector, results were comprised entirely of pollution abatement and control expenditure as other environment protection expenditure have not yet been investigated. Table 5.1 indicates the costs borne by manufacturing industries to be $980.7 million in 1992–93 and $701.5 million in 1993–94.

5.1 MANUFACTURING SECTOR ENVIRONMENT PROTECTION EXPENDITURE

	1992–93	*1993–94*
	$m	$m
Pollution abatement and control		
Capital expenditure	421.5	227.8
Current expenditure	574.2	473.7
Total pollution abatement and control expenditure	995.7	701.5
Minus other environmental grants and subsidies(a)	15.0	n.c.
Total(b)	980.7	701.5

(a) This figure is deducted, where known, to ensure there is no double counting in the final estimates for expenditure for all Australian industry and government.

(b) Expenditure by manufacturing businesses on environmental expenditure not related to pollution abatement and control have yet to be investigated.

Table 5.2 presents a summary of expenditure on pollution abatement and control by industry subdivision for the financial years 1992–93 and 1993–94. Expenditure to protect the environment accounted for 0.6% (1992–93) and 0.4% (1993–94) of total turnover by manufacturing industries for these years. Overall, there was a 30% decrease in expenditure to protect the environment between 1992–93 and 1993–94. Most of the drop is attributed to a substantial decrease in capital expenditure in 1993–94 ($421.5 million in 1992–93 and $227.8 million in 1993–94), most notably in the petroleum, coal, chemical and associated product subdivision ($108.7 million in 1992–93 and $34.4 million in 1993–94), and the metal product industry ($210.1 million in 1992–93 and $73.3 million in 1993–94).

The metal product manufacturing subdivision accounted for 45.1% ($449.3 million) in 1992–93 and 35.0% ($245.4 million) in 1993–94 of total pollution abatement and control expenditure, with the petroleum, coal, chemical and associated products subdivision accounting for 20.5% ($203.7 million) in 1992–93 and 19.9% ($139.8 million) in 1993–94.

Changes to survey methodology and collection units, as well as high standard errors, may have contributed to variations in expenditure between 1992–93 and 1993–94. Comparisons should be viewed with this in mind.

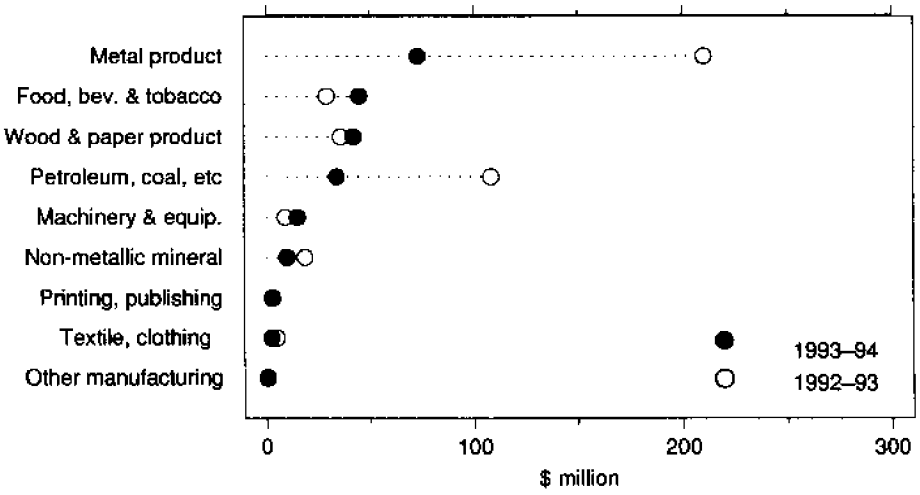
5.2 ENVIRONMENT PROTECTION EXPENDITURE, By Industry

ANZSIC code	Industry	Capital expenditure $m	Current expenditure $m	Total $m
	1992–93			
21	Food, beverage and tobacco	29.4	87.6	117.0
22	Textile, clothing, footwear and leather	5.3	23.9	29.3
23	Wood and paper product	35.9	38.3	74.2
24	Printing, publishing and recorded media	2.8	9.4	12.2
25	Petroleum, coal, chemical and associated product	108.7	95.0	203.7
26	Non-metallic mineral product	19.0	24.5	43.5
27	Metal product	210.1	239.1	449.3
28	Machinery and equipment	9.6	48.3	57.9
29	Other manufacturing	0.8	7.9	8.6
21-29	*Total manufacturing*	*421.5*	*574.2*	*995.7*
	1993–94			
21	Food, beverage and tobacco	45.1	79.2	124.4
22	Textile, clothing, footwear and leather	2.7	15.7	18.5
23	Wood and paper product	42.4	18.5	61.0
24	Printing, publishing and recorded media	3.4	8.7	12.1
25	Petroleum, coal, chemical and associated product	34.4	105.3	139.8
26	Non-metallic mineral product	10.4	24.5	34.9
27	Metal product	73.3	172.1	245.4
28	Machinery and equipment	15.5	43.9	59.4
29	Other manufacturing	0.5	5.7	6.2
21-29	*Total manufacturing*	*227.8*	*473.7*	*701.5*

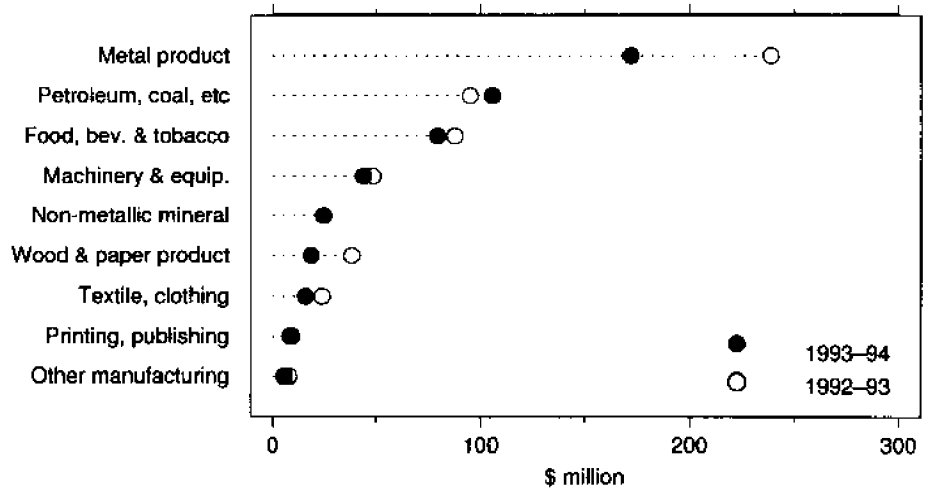
Graphs 5.3 and 5.4 present capital and current expenditures by industry subdivision. Highest levels of capital expenditure on environment protection occurred in the metal product industry (49.8% in 1992–93 and 32.2% in 1993–94). Next highest in 1992–93 was the petroleum, coal, chemical and associated product industry (25.8%), with the food, beverage and tobacco industries contributing the second highest expenditure on capital expenditure to protect the environment in 1993–94 ($45.1 million or 19.8%).

Metal product industries spent the most on current expenditure to protect the environment. In 1992–93, 41.6% of total current expenditure ($239.1 million) was spent on these measures, and 36.3% ($172.1 million) in 1993–94.

5.3 CAPITAL EXPENDITURE ON ENVIRONMENT PROTECTION, By Industry



5.4 CURRENT EXPENDITURE ON ENVIRONMENT PROTECTION, By Industry



CAPITAL EXPENDITURE

Table 5.5 separates capital expenditure on pollution abatement and control into two elements: end-of-line and change-in-production. End of line techniques refer to the treatment of pollutants after they have been produced by installing distinct abatement facilities. Change in production reduces or eliminates the production of pollution by preventing its occurrence. This can be achieved by material substitution, modified production processes, or equipment alteration.

The bulk of end-of-line expenditure to protect the environment was by the metal product industry with 53.1% ($158.0 million) being spent in 1992–93, and 36.9% ($57.6 million) in 1993–94. The petroleum, coal, chemical and associated product industry subdivision contributed 23.9% ($71.1 million) in 1992–93 , with the food, beverage and tobacco subdivision accounting for the second highest expenditure in this category in 1993–94 (18.4% or $28.7 million).

Change-in-production expenditure primarily for the purpose of protecting the environment amounted to $52.2 million (42.2% of total change-in-production expenditure for this purpose) by the metal product industry in 1992–93. The wood and paper product subdivision spent the most on integrated technologies to protect the environment in 1993–94 ($18.0 million or 25.1%), followed by the food, beverage and tobacco subdivision which contributed 22.8% ($16.4 million) of total manufacturing industry expenditure on such integrated technology in 1993–94.

5.5 CAPITAL EXPENDITURE ON ENVIRONMENT PROTECTION, By Industry

ANZSIC code	Industry	End of line $m	Change in production $m	Total $m
	1992–93			
21	Food, beverage and tobacco	20.1	9.3	29.4
22	Textile, clothing, footwear and leather	3.0	2.3	5.3
23	Wood and paper product	21.2	14.7	35.9
24	Printing, publishing and recorded media	2.2	0.6	2.8
25	Petroleum, coal, chemical and associated product	71.1	37.6	108.7
26	Non-metallic mineral product	17.3	1.6	19.0
27	Metal product	158.0	52.2	210.1
28	Machinery and equipment	4.3	5.3	9.6
29	Other manufacturing	0.6	0.2	0.8
21–29	*Total manufacturing*	*297.7*	*123.8*	*421.5*
	1993–94			
21	Food, beverage and tobacco	28.7	16.4	45.1
22	Textile, clothing, footwear and leather	2.2	0.6	2.7
23	Wood and paper product	24.4	18.0	42.4
24	Printing, publishing and recorded media	1.7	1.7	3.4
25	Petroleum, coal, chemical and associated product	21.6	12.7	34.4
26	Non-metallic mineral product	8.7	1.7	10.4
27	Metal product	57.6	15.7	73.3
28	Machinery and equipment	10.6	4.9	15.5
29	Other manufacturing	0.4	0.1	0.5
21–29	*Total manufacturing*	*156.0*	*71.8*	*227.8*

CURRENT EXPENDITURE

Table 5.6 presents a break-down of current expenditure on environment protection by manufacturing industries into the component items, payments to the private sector and payments to government agencies. Expenditures include services on waste management, pollution monitoring, and specific charges by the agencies.

Payments to the private sector for waste management accounted for 78.7% ($452.0 million) of current expenditure to protect the environment in 1992–93, and 80.6% ($381.7 million) in 1993–94. Waste handling expenses to government by manufacturers accounted for 21.3% ($122.2 million) in 1992–93, and 19.4% ($92.1 million) in 1993–94.

Payments to non-government agencies for waste management were highest by the metal product industry, with 50.5% ($228.1 million) of total non-government waste management expenses being spent by this group in 1992–93, and 43.3% ($165.4 million) in 1993–94. The next largest was the petroleum, coal, chemical and associated product subdivision ($75.5 million in 1992–93 and $91.1 million in 1993–94).

Expenditure on government services for waste management was highest in the food, beverage and tobacco industry. This subdivision spent $36.9 million (30.2% of total payments to government) in 1992–93 and $32.7 million (35.5%) in 1993–94.

5.6 CURRENT EXPENDITURE ON ENVIRONMENT PROTECTION, By Industry

ANZSIC code	Description	Payments to government $m	Payments to non-government $m	Total $m
	1992–93			
21	Food, beverage and tobacco	36.9	50.7	87.6
22	Textile, clothing, footwear and leather	11.9	12.1	23.9
23	Wood and paper product	14.6	23.7	38.3
24	Printing, publishing and recorded media	3.7	5.7	9.4
25	Petroleum, coal, chemical and associated product	19.5	75.5	95.0
26	Non-metallic mineral product	5.8	18.8	24.5
27	Metal product	11.0	228.1	239.1
28	Machinery and equipment	16.1	32.3	48.3
29	Other manufacturing	2.8	5.1	7.9
21–29	*Total manufacturing*	*122.2*	*452.0*	*574.2*
	1993–94			
21	Food, beverage and tobacco	32.7	46.6	79.2
22	Textile, clothing, footwear and leather	9.2	6.6	15.7
23	Wood and paper product	5.1	13.5	18.5
24	Printing, publishing and recorded media	3.9	4.8	8.7
25	Petroleum, coal, chemical and associated product	14.2	91.1	105.3
26	Non-metallic mineral product	7.6	16.9	24.5
27	Metal product	6.7	165.4	172.1
28	Machinery and equipment	11.0	32.9	43.9
29	Other manufacturing	1.8	3.9	5.7
21–29	*Total manufacturing*	*92.1*	*381.7*	*473.7*

COMPARISON OF RESULTS 1991 92 TO 1993 94

Table 5.8 provides a comparison between 1991–92, 1992–93 and 1993–94 expenditure by manufacturing industries to protect the environment. Pollution abatement and control expenditures by manufacturing industries were also collected for the 1990–91 financial year. These figures have not been included in this comparison, however, due to a change in coverage between this year and the following collection periods.

Total expenditure has decreased by 30.3% over the 1991–92 and 1993–94 period, with the majority of the decrease being attributed to a fall in capital expenditure in 1993–94.

5.8 ENVIRONMENT PROTECTION EXPENDITURE(a), By Industry

ASIC/ANZSIC(b) code	Industry	Capital $m	Current $m	Total $m
	1991–92			
21	Food, beverage and tobacco manufacturing	76.5	70.2	146.7
23	Textile manufactring	3.4	10.2	13.6
24	Clothing and footwear	1.7	3.2	4.9
25	Wood, wood products and furniture	6.3	16.8	23.1
26	Paper products, printing and publishing	21.2	47.0	68.2
27	Chemical, petroleum and coal products	107.4	131.2	238.6
28	Non-metallic mineral	10.3	37.6	47.9
29	Basic metal products	222.7	124.4	347.1
31	Fabricated metal products	6.8	19.6	26.4
32	Transport equipment	10.3	12.7	23.0
33	Other machinery and equipment	8.7	20.5	29.2
34	Miscellaneous	8.7	29.1	37.8
21–34	*Total manufacturing*	*484.0*	*522.4*	*1 006.4*
	1992–93			
21	Food, beverage and tobacco manufacturing	29.4	87.6	117.0
22	Textile, clothing, footwear and leather manufacturing	5.3	23.9	29.3
23	Wood and paper product manufacturing	35.9	38.3	74.2
24	Printing, publishing and recorded media	2.8	9.4	12.2
25	Petroleum, coal, chemical and associated product manufacturing	108.7	95.0	203.7
26	Non-metallic mineral product manufacturing	19.0	24.5	43.5
27	Metal product manufacturing	210.1	239.1	449.3
28	Machinery and equipment manufacturing	9.6	48.3	57.9
29	Other manufacturing	0.8	7.9	8.6
21–29	*Total manufacturing*	*421.5*	*574.2*	*995.7*
	1993–94			
21	Food, beverage and tobacco manufacturing	45.1	79.2	124.4
22	Textile, clothing, footwear and leather manufacturing	2.7	15.7	18.5
23	Wood and paper product manufacturing	42.4	18.5	61.0
24	Printing, publishing and recorded media	3.4	8.7	12.1
25	Petroleum, coal, chemical and associated product manufacturing	34.4	105.3	139.8
26	Non-metallic mineral product manufacturing	10.4	24.5	34.9
27	Metal product manufacturing	73.3	172.1	245.4
28	Machinery and equipment manufacturing	15.5	43.9	59.4
29	Other manufacturing	0.5	5.7	6.2
21–29	*Total manufacturing*	*227.8*	*473.7*	*701.5*

(a) Pollution abatement and control expenditures for the manufacturing industry were collected for 1990–91 also. Figures for this year have not been included as expenditure data was collected from selected high stressor industries only and are not directly comparable to the following years.

(b) Industry classification for 1991–92 (ASIC) has now been replaced by ANZSIC, 1992-93 and 1993-94. As such, some comparability has been lost between ASIC and ANZSIC standards.

CHAPTER 6 SERVICE AND OTHER INDUSTRIES

INTRODUCTION

Waste handling expenses were identified as the major environment protection expenditure incurred by construction, wholesale, retail and services industry subdivisions. Data collected by the ABS Economic Activity Survey separately identified waste handling expenses paid by businesses in these industries to government and private contractors. Payments to government agencies for waste removal and/or disposal include direct charges, such as fees, levies and other payments to local government, government contractors or agencies for such activities as incineration, specific sewerage charges and tip fees. Payments to private contractors include payments or fees to subcontractors, site cleaners and expenditure on the transportation and/or disposal of waste.

In the 1991–92 financial year, waste removal expenses were collected for the wholesale and retail industries only. In 1992–93 and 1993–94, the collection was broadened to include the remainder of relevant industries not covered in the earlier chapters of this publication. The results are presented in tables 6.1 and 6.2. This collection was established and conducted for the first time in 1992–93, and standard errors are, in some cases, very high. This should be kept in mind when comparing data.

OVERVIEW OF RESULTS

Total expenditure on waste handling expenses amounted to $348.6 million in 1992–93 and $451.1 million in 1993–94. The majority of these expenses were paid to private contractors (68% of total waste handling expenses in 1992–93 and 79% in 1993–94). The increase in payments to private contractors in 1993–94 was attributed to large increases in waste handling expenses by water supply, sewerage and drainage services; the construction industry; property services; and health services. In most cases, these increases can be explained by the large standard errors.

The highest level of expenditure overall occurred in ANZSIC 96 category 'Other services', with $114.0 million being spent in 1992–93 and $99.8 million in 1993–94. This subdivision includes waste disposal services, the primary activities of which are garbage collection and disposal; industrial waste collection and disposal; night soil collection and disposal; rubbish dump operation; and sanitary disposal services.

After Other services, the next highest expenditure on waste handling was by the Accommodation, cafes and restaurants industry ($57.9 million in 1992–93 and $49.2 million in 1993–94). Accommodation, cafes and restaurants and Other services contributed almost half (49%) of the total waste handling expenses in this grouping of industries in 1992–93. Major expenditure for 1993–94 was distributed across three industry subdivisions, with Other services, Accommodation, cafes and restaurants, and General construction contributing 43% of total waste handling expenses for the year.

6.1 SELECTED SERVICE INDUSTRIES WASTE REMOVAL EXPENSES, By Industry—1992–93

ANZSIC code	Industry	*Waste handling expenses paid to government* $m	% of total waste handling expenses	*Waste handling expenses paid to private contractors* $m	% of total waste handling expenses	*Total waste handling expenses* $m	% of total waste handling expenses
	Agriculture, forestry and fishing						
2	Services to agriculture	0.0	0.0	0.1	0.0	0.1	0.0
3	Forestry and logging	0.0	0.0	0.1	0.0	0.1	0.0
4	Commercial fishing	0.3	0.1	0.1	0.0	0.4	0.1
	Mining						
15	Services to mining	0.0	0.0	3.1	0.9	3.1	0.9
	Electricity, gas and water supply						
37	Water supply, sewerage and drainage services	0.2	0.1	4.3	1.2	4.5	1.3
	Construction						
41	General construction	1.4	0.4	20.4	5.9	22.0	6.3
42	Construction trade services	2.2	0.6	4.8	1.4	7.0	2.0
	Wholesale trade						
45	Basic material wholesaling	0.1	0.0	9.5	2.7	9.6	2.8
46	Machinery and motor vehicle wholesaling	7.7	2.2	9.2	2.6	16.9	4.8
47	Personal and household good wholesaling	0.8	0.2	11.7	3.4	12.5	3.6
	Retail trade						
51	Food retailing	0.9	0.3	18.4	5.3	19.3	5.5
52	Personal and household good retailing	2.5	0.7	9.6	2.8	12.2	3.5
53	Motor vehicle retailing and services	5.0	1.4	12.1	3.5	17.1	4.9
57	Accommodation, cafes and restaurants	16.8	4.8	41.2	11.8	57.9	16.6
	Transport and storage						
61	Road transport	0.4	0.1	9.4	2.7	9.8	2.8
62	Rail transport	0.0	0.0	0.6	0.2	0.6	0.2
63	Water transport	0.1	0.0	0.7	0.2	0.8	0.2
64	Air and space transport	0.2	0.1	1.5	0.4	1.7	0.5
65	Other transport	0.0	0.0	0.1	0.0	0.1	0.0
66	Services to transport	0.1	0.0	1.7	0.5	1.8	0.5
67	Storage	0.1	0.0	1.2	0.4	1.4	0.4
71	Communication services	0.0	0.0	0.1	0.0	0.1	0.0
	Finance and insurance						
73	Finance	0.1	0.0	1.6	0.5	1.7	0.5
75	Services to finance and insurance	0.3	0.1	1.1	0.3	1.4	0.4
	Property and business services						
77	Property services	0.3	0.1	2.9	0.8	3.2	0.9
78	Business services	2.0	0.6	6.9	2.0	8.9	2.6
84	Education	0.4	0.1	2.7	0.8	3.1	0.9
	Health and community services						
86	Health services	0.7	0.2	7.2	2.1	7.9	2.3
87	Community services	0.0	0.0	0.1	0.0	0.1	0.0
	Cultural and recreational services						
92	Libraries, museums and the arts	0.1	0.0	0.3	0.1	0.4	0.1
93	Sport and recreation	0.7	0.2	4.0	1.1	4.7	1.3
	Personal and other services						
95	Personal services	2.2	0.6	2.3	0.7	4.5	1.3
96	Other services	67.4	19.3	46.6	13.4	114.0	32.7
	Total	**113.0**	**32.4**	**235.6**	**67.6**	**348.6**	**100.0**

6.2 SELECTED SERVICE INDUSTRIES WASTE REMOVAL EXPENSES, By Industry—1993–94

ANZSIC code	Industry	Waste handling expenses paid to government		Waste handling expenses paid to private contractors		Total waste handling expenses	
		$m	% of total waste handling expenses	$m	% of total waste handling expenses	$m	% of total waste handling expenses
	Agriculture, forestry and fishing						
2	Services to agriculture	0.2	0.0	0.6	0.1	0.8	0.2
3	Forestry and logging	0.1	0.0	0.1	0.0	0.2	0.0
4	Commercial fishing	0.2	0.0	0.4	0.1	0.6	0.1
	Mining						
15	Services to mining	0.1	0.0	0.8	0.2	0.9	0.2
	Electricity, gas and water supply						
37	Water supply, sewerage and drainage services	0.8	0.2	25.1	5.6	25.9	5.7
	Construction						
41	General construction	3.6	0.8	43.1	9.6	46.7	10.4
42	Construction trade services	1.3	0.3	14.1	3.1	15.4	3.4
	Wholesale trade						
45	Basic material wholesaling	1.7	0.4	12.9	2.9	14.5	3.2
46	Machinery and motor vehicle wholesaling	1.7	0.4	17.6	3.9	19.3	4.3
47	Personal and household good wholesaling	2.0	0.4	12.1	2.7	14.1	3.1
	Retail trade						
51	Food retailing	2.6	0.6	21.5	4.8	24.1	5.3
52	Personal and household good retailing	2.2	0.5	8.4	1.9	10.6	2.4
53	Motor vehicle retailing and services	5.4	1.2	19.5	4.3	24.8	5.5
57	Accommodation, cafes and restaurants	15.5	3.4	33.6	7.5	49.2	10.9
	Transport and storage						
61	Road transport	1.0	0.2	5.8	1.3	6.8	1.5
62	Rail transport	0.0	0.0	2.0	0.4	2.0	0.4
63	Water transport	0.1	0.0	0.9	0.2	0.9	0.2
64	Air and space transport	0.0	0.0	4.3	1.0	4.3	1.0
65	Other transport	0.0	0.0	0.2	0.0	0.2	0.0
66	Services to transport	0.6	0.1	2.2	0.5	2.8	0.6
67	Storage	0.4	0.1	1.7	0.4	2.1	0.5
71	Communication services	0.0	0.0	0.2	0.0	0.2	0.0
	Finance and insurance						
73	Finance	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.
75	Services to finance and insurance	0.3	0.1	7.4	1.6	7.7	1.7
	Property and business services						
77	Property services	5.0	1.1	17.1	3.8	22.1	4.9
78	Business services	1.0	0.2	10.3	2.3	11.3	2.5
84	Education	1.1	0.2	5.1	1.1	6.2	1.4
	Health and community services						
86	Health services	2.0	0.4	21.0	4.7	23.0	5.1
87	Community services	1.9	0.4	2.8	0.6	4.7	1.0
	Cultural and recreational services						
92	Libraries, museums and the arts	0.4	0.1	0.6	0.1	1.0	0.2
93	Sport and recreation	0.5	0.1	4.1	0.9	4.7	1.0
	Personal and other services						
95	Personal services	1.5	0.3	2.6	0.6	4.2	0.9
96	Other services	42.8	9.5	56.9	12.6	99.8	22.1
	Total	**96.0**	**21.3**	**355.0**	**78.7**	**451.1**	**100.0**

CHAPTER 7 HOUSEHOLD SECTOR

INTRODUCTION

This chapter considers expenditure in the household sector that contributes to total environment protection expenditure. The household sector undertakes activities aimed at the prevention, reduction and elimination of pollution and environmental problems. Private households can integrate more environmental aspects into their consumption decisions by:

- buying special goods and services for environmental protection;
- accepting higher prices for those goods and services whose production, use or disposal is less harmful to the environment; and
- actively contributing to the reduction of environmental burdens or the removal of environmentally polluting goods.

The household sector also contributes to pollution prevention activities undertaken by the public sector, through payment of charges for activities such as sewage and garbage disposal services.

The SERIEE framework, outlined in chapter 1, displays household expenditure on environment protection according to characteristic activities and the use of products which are linked to environmental protection (connected products and adapted products). See the Explanatory Notes for a discussion of these items.

SERIEE includes the extra cost of an environmentally friendly product over a normal product in environment protection expenditure. However, this approach is becoming problematic as the market competitiveness of environmental goods has increased, and as governments increasingly intervene in the market to stimulate increased purchasing of environmentally preferred alternatives. Therefore, figures which would seem to suggest a decrease in environment expenditure could actually be showing increased efficiency in environment protection. To take an extreme example, it was recommended that the price differential between leaded and unleaded petrol be included in household expenditure estimates, but as a result of differences in the excise taxes applied by the Commonwealth Government from 1993, unleaded petrol is actually being sold more cheaply than leaded fuel.

OVERVIEW OF RESULTS

Table 7.1 provides a brief overview of the expenditure of the household sector on environmental protection. The partial estimate indicates that, for the categories listed, this sector financed environmental protection activities to the value of $1,724 million in 1992–93 and $1,978 million in 1993–94 ($1,772 million excluding the figure for Insulation).

7.1 HOUSEHOLD ENVIRONMENT EXPENDITURE(a)

Expenditure	1992–93 $m	1993–94 $m
Transport		
Catalytic converters for vehicles	68	71
Charcoal filters for vehicles	9	10
Dwellings		
Septic systems(a)	49	49
Environmental component of local government rates	501	497
Special environmental levies(a)	110	113
Insulation(b)	--	206
Sewerage charges(a)	987	1 032
Total	**1 724**	**1 978**

(a) Partial estimates only.

(b) Derived from HES data.

TRANSPORT

Motor vehicles are a major source of atmospheric pollutants, contributing nearly two-thirds of the carbon monoxide, half of human-made nitrous oxides (NOx), and approximately half of the hydrocarbons in industrialised countries (World Resources Institute 1992).

Pollution abatement devices

A catalytic converter can reduce emissions of carbon monoxide by approximately 85% and NOx by about 60% (World Resources Institute 1992). Catalytic converters vary considerably in price due to the precious metals used as a coating, but after consultations with manufacturers of converters and motor vehicles, a figure of $150 was selected as an average price. Multiplying this figure by the number of new passenger vehicles registered during 1992–93 (449,777) and 1993–94 (475,981), and assuming constant price, expenditure on catalytic converters is estimated at $67.5 million in 1992–93 and $71.4 million in 1993–94.

Another mandatory pollution abatement device is a charcoal filter, which is designed to reduce emissions of fuel vapours. Investigations with producers and car retailers indicated an average cost of $20, representing a total expenditure by households of $9 million in 1992–93 and $9.5 million in 1993–94.

Figures for vehicles are likely to be overestimates of the true costs to households, since a proportion of passenger vehicles will be fleet purchases by industry and government sectors. However, it has not been possible to draw out the household component of these estimates.

For environmental purposes, some States specify legal limits on exhaust emissions from motor vehicles. Cars which are not fitted with a catalytic converter must be well maintained in order to comply with these limits. No figures are available for 'tune-ups' for this purpose. The ABS Household Expenditure Survey does have an item for 'vehicle servicing', but as this covers a range of services, it would be an overestimation of any spending specifically aimed at exhaust emissions. Consequently, no estimates have been included from that survey.

DWELLINGS

Private sewerage systems

The cost of private sewerage treatment systems is identified specifically by the OECD as a pollution abatement expenditure. Investigations determined an approximate cost of $3,500 per system in 1991–92. Aerobic systems are more expensive and, although becoming more popular, they account for only 10% of the market. An estimate for the number of systems approved by the relevant authorities across Australia is difficult to obtain because the authority for approval usually lies with individual local councils. However, the environmental health departments in most States provided estimates for 1991–92. The figures for the 1992–93 and 1993–94 financial years, shown in table 7.2, were obtained by multiplying estimated numbers of new approvals for private constructions with State by State costs for the sewerage systems. House Price Indices were used to estimate system costs.

7.2 HOUSEHOLD EXPENDITURE ON PRIVATE SEWERAGE FACILITIES

	1992–93		1993–94	
State/Territory(a)	no. of approvals	$m	no. of approvals	$m
New South Wales	3 500	12.3	3 500	12.9
Victoria	4 500	16.2	4 500	16.6
South Australia	3 000	9.0	2 500	9.0
Tasmania	2 000	7.5	1 500	5.9
Northern Territory	1 000	4.2	1 000	4.8
Total	**14 000**	**49.2**	**13 000**	**49.2**

(a) Excludes Western Australia and Queensland for which estimates were not available.

Source: Various State health departments, environmental health departments, building departments/branches, plumbing inspectors, *House Price Indices*, *Building Approvals* (8731.0).

Insulation

Insulation is required in all new dwellings in a number of States, under the Building Code of Australia Part F6. The ABS Household Expenditure Survey 1988–89 reported that households spent an average of 37 cents per week on insulation ($104.3 million). In 1993–94 the Survey put the figure at 60 cents per week ($206 million). Adjusting for Consumer Price Index (CPI) as it relates to 'Housing equipment and operation', this was equivalent to 53 cents a week at 1988–89 prices, and therefore represented a significant real increase in expenditure on insulation.

FEES AND CHARGES

Table 7.3 indicates government fees and charges received from households for provision of environment-related services (as defined in chapter 2) by local and State government. The Government Purpose Classification (GPC) code listed in the table reflects the same set of codes as were used in chapter 2, where government expenditure on these items was analysed.

Water and sewerage provision are being increasingly corporatised, which may account partly for the sewerage value in the Public Finance Statistics dropping from $40 million in 1992–93 to $29 million in 1993–94. New South Wales has four statutory water authorities for non-capital regions, and one major water board for the capital. The Melbourne metropolitan area wholesales sewerage handling to three retail outlets, while 18 State water authorities handle liquid waste in non-capital regions. South Australia has privatised the retail aspects of sewerage handling. Western Australia has two statutory authorities handling sewerage. The ABS expects to collect data on fees and charges from these statutory authorities in the 1994–95 publication.

7.3 GOVERNMENT FEES AND CHARGES FOR ENVIRONMENT PROTECTION

	1992–93	*1993–94*
GPC code	$m	$m
0731 Household garbage	450	466
0733 Sewerage	40	29
0734 Urban stormwater drainage	11	2
Total	**501**	**497**

Source: Unpublished data, Public Finance Statistics

Household waste

In 1992, Australia produced an estimated 7 million tonnes of household waste, defined as wastes collected and handled by local government. This represented a per capita production of 394 kilograms, or 1,100 kilograms of waste for each of the 6.32 million Australian households (ABS Year Book 1996). Table 7.4 shows the comparison between Australia and some other countries.

7.4 HOUSEHOLD WASTE PRODUCTION, 1992

Country	Total production million tonnes	Per capita production kg
Australia	**7.0**	**394**
Netherlands	6.6	430
France	20.5	355
Mexico	22.5	244
Poland	8.4	218

Source: OECD 1995.

Australian households paid $450 million for household garbage treatment in 1992–93, giving an approximate cost of $71 per household for garbage treatment.

Sewerage provision

Table 7.5 shows fees paid for sewerage provision by households in nine major water authority areas. The fees were calculated by multiplying average sewerage bills by the number of properties serviced. Most authorities charged a schedule of fixed rates, based on property values. The exceptions were Canberra and Darwin, where a flat base rate applied, and the Geelong and Newcastle authorities, which had a fixed charge and a volumetric charge. The total population served by these authorities was 10.25 million in 1992–93 and 10.53 million in 1993–94, approximately 60% of Australia's total population in each case.

7.5 EXPENDITURE ON SEWERAGE, Households—Major Distributors

State/Territory (Authorities)	1992–93 $m	1993–94 $m
New South Wales (Sydney-Illawarra-Blue Mountains)	345.4	370.5
New South Wales (Hunter region)	42.5	33.7
Victoria (Melbourne)	310.3	299.8
Victoria (Geelong region)	15.8	26.1
Queensland (Brisbane)	41.2	42.9
South Australia (Adelaide)	89.4	93.0
Western Australia (Perth)	109.6	130.0
Australian Capital Territory	25.3	27.9
Northern Territory	7.9	8.2
Total	**987.4**	**1 032.1**

Source: ARMCANZ 1994.

Special environmental levies

A number of local governments use 'precept rating' powers to raise funds for special purposes. One example of this is the levy imposed by the Brisbane City Council. All ratepayers pay a 'bushland acquisition levy' ($20 in 1992–93, $24 in 1993–94) to raise funds for the purchase of environmentally sensitive land for permanent preservation. The total amounts raised in the financial years 1992–93 and 1993–94 were $5.4 million and $7 million respectively, of which approximately 90% ($5.0 million and $6.2 million) was from the residential sector.

Some Public Trading Enterprises (PTEs) are also putting 'special environmental levies' on their rate notices. The Sydney Water Board, for example, from 1989 through to December 1994, collected $80 per property for a 'clean waterways program' which amounted to $485 million over the five years or approximately $97 million for each year. Of this amount, 87% ($84.4 million) was attributable to the residential sector.

From July 1991 until 30 June 1996 the water board in Geelong, Victoria, collected an environmental levy. Customers were charged between $65 and $135 (average of $92) based on the valuation of their properties, to raise money to meet Victorian Environment Protection Authority (VicEPA) guidelines. Over the five year period approximately $40 million was raised for upgrading the Anglesea and Blackrock waste water treatment plants. In the 1992–93 financial year, a total of $7.8 million was raised, rising slightly to $7.9 million in 1993–94. Using the Brisbane and Sydney figures as an example, almost 90% of this revenue, or about $7 million in each financial year, would have been derived from the household sector.

In the Australian Capital Territory, sewerage rates include a charge for specific environmental works. This was $25 per property in 1992–93 and $40 per property in 1993–94, raising $2.6 million and $4.2 million respectively. The Hunter Water Corporation in New South Wales also charges an environmental levy for sewerage. The charge of $74 per property raised $9.7 million in 1992–93 and $10.1 million in 1993–94.

Table 7.6 provides a summary of special environmental levies. These levies raised $109.5 million for 1992–93 and $112.8 million for 1993–94. However, it should be noted that this is only an experimental estimate, and will fall short of the total expenditures Australia-wide.

7.6 ENVIRONMENTAL LEVIES, Households—Major Water Authorities

State/Territory (Authorities)	1992–93 $m	1993–94 $m
New South Wales (Sydney-Illawarra-Blue Mountains)	84.4	84.4
New South Wales (Hunter region)	9.7	10.1
Victoria (Geelong region)	7.8	7.9
Queensland (Brisbane)	5.0	6.2
Australian Capital Territory	2.6	4.2
Total	**109.5**	**112.8**

Sources: Water authorities (various), ARMCANZ 1994.

Rebates

The Brisbane City Council rebates $30 to property owners under the vegetation protection agreement. This is equivalent to the bushland acquisition levy. A new voluntary conservation program operated by the Council involves cash assistance instead of a rate rebate. Residents who agree to make their property a conservation zone, and enter into a binding conservation agreement, are eligible for a cash grant. This may be as much as 50 per cent of the general rates, which are based on the valuation of the land. The conditions of this agreement vary depending on the location of the property. Households in a koala habitat reserve area, for instance, may be eligible for the discount if they fence their property to control their domestic pets.

EXPLANATORY NOTES

SUMMARY

The ABS approach to estimating environment protection expenditures

1 In compiling the data presented in chapter 1 of this publication, and dealing with the issues outlined in the previous sections, the ABS has taken the approach of ensuring the 'bottom line' is correct, i.e. obtaining an unduplicated estimate for environment protection expenditures in Australia.

For the private sector, these estimates primarily represent pollution abatement and control estimates as prescribed by the OECD pollution abatement and control framework. This was described in detail in the last edition of *Cost of Environment Protection, Australia, Selected Industries 1991–92* (4603.0). Terms used in describing pollution abatement and control activities include:

- End-of-line techniques. These treat pollutants after generation in production processes, by the use of separately identifiable abatement facilities. They are installed for the purpose of abating pollutant streams, and do not affect the production process itself; and
- Change-in-production processes. These reduce or eliminate the generation of pollutants by employing material substitution, improved catalysts, re-use of water or equipment alteration. These changes may involve converting equipment to handle the use of substitute fuels that generate less pollutants.

Typically, industry undertakes end-of-line expenditures in the initial stages of expenditure on pollution abatement facilities, and moves to change-in-production processes as the industry's pollution abatement activity progresses, and particularly as re-equipment becomes due for other reasons.

2 Chapter 2 presents some data according to an international framework (SERIEE), which integrates pollution abatement costs with other environment protection expenditure within a single framework. This chapter presents both expenditure and outlays data on environment protection by the public sector.

The difference between 'gross expenditures' and 'outlays' as defined in government finance statistics is illustrated below. Outlays indicate the final costs borne by the public sector in terms of the extent of subsidisation of a range of services provided by the public sector.

The estimates of inter-sectoral flows have also been complicated by difficulties in collecting reliable estimates from industry for grants and subsidies received from government for pollution abatement and control.

RELATIONSHIP BETWEEN EXPENDITURE AND OUTLAYS

Current
- Gross current expenditure
- Less sales of goods and services(a)
- Equals final consumption expenditure
- Plus interest payments(b)
- Plus subsidies paid to public trading enterprises(b)
- *Equals total current outlays*

Expenditure on new fixed assets
- Plus expenditure on second-hand assets
- *Equals* gross fixed capital expenditure
- Plus capital grants to public trading enterprises(c)
- Plus advances paid to public trading enterprises (net)
- Plus other capital outlays
- *Equals total capital outlays*

(a) This item provides an indication of the extent of government charges levied. The charges are off-set against gross expenditure in calculating final consumption expenditure and comprise mainly sales to the private sector.

(b) Current transfer payments include payment for property rights (e.g. interest payments) and unrequited transfers for which there is no return for payment, such as subsides, personal benefit payments and current grants.

(c) Unrequited payments intended to contribute towards the cost of capital expenditure of the recipients.

INTERNATIONAL WORK IN ENVIRONMENT PROTECTION EXPENDITURE

3 In 1994, Eurostat (the statistical agency of the European Community) released the second edition of the European System for the Collection of Economic Information on the Environment —SERIEE. The scope of SERIEE is all environment protection expenditure, not just pollution abatement and control expenditure. Within this framework, environment protection is defined as 'all actions and activities that are aimed at the prevention, reduction and elimination of pollution, as well as any other degradation of the environment' (Eurostat 1994).

SERIEE comprises two accounts: the Environment Protection Expenditure Account (EPEA) and the Resource Use and Management Account. Of these, the EPEA is more developed. The objective of the EPEA is to answer the following questions:

- how much a nation spends on environment protection expenditure;
- how and by which units the expenditure is financed; and
- which economic activities are induced by environmental protection activities.

SERIEE generates three central tables which address the three issues listed above. These tables were described in detail in the last edition of this publication. SERIEE also indicates that a range of more detailed sub-accounts can be developed to suit individual countries requirements and data availability situations.

SERIEE has addressed a number of methodological issues associated with estimating environment expenditure. It is much more detailed in its data requirements than the OECD Pollution Abatement and Control framework, and its implementation in Australia is in its infancy. The ABS will continue to monitor, explore and contribute to such international developments in the emerging area of environmental expenditure statistics.

4 Definitions of key terms used in these tables are listed below:

- Characteristic activities, services and products : activities whose purpose is environmental protection. The activities so defined are specified in the Single European Standard Statistical Classification of Environmental Protection Activities (CEPA). Their output consists of characteristic services.
  Characteristic product use contributes to environment protection. The overall grouping of characteristic services and products is designated by the term specific products.
  Characteristic activities may be executed as principal, secondary or ancillary activities. Principal and secondary activities may be either sold on the market (market output) or at prices that are not economically significant (non-market output). Characteristic activities are also executed as ancillary activities. A producer may execute on its own and for its own use environmental protection activities (reduction of emissions, treatment of pollutants) made necessary in order to limit the negative effects of its activity on the environment. In this case the services produced are qualified as ancillary.
- Specialised producers : execute a characteristic activity as their principal activity. Specialised producers belonging to general government and non-profit institutions serving households are distinguished from specialised producers belonging to other sectors.
- Other producers : execute a characteristic activity as a secondary or ancillary to a principal non-characteristic activity. These producers are grouped according to non-characteristic activity.
- Connected and adapted products : These are products which are not characteristic services but whose use serves an environmental protection purpose. Connected and adapted products may be durable or non-durable products. They may be used for final or intermediate consumption or for gross capital formation. Connected products directly serve an environmental purpose but are not characteristic services (e.g. catalytic converters, septic tanks, rubbish containers). Adapted products are defined as products that on one hand are less polluting at the time of their consumption and/or scrapping than equivalent normal products. (Equivalent normal products are those which furnish similar utility, irrespective of the impact on the environment). On the other hand they are more costly than equivalent normal products. Only the extra cost is considered as environment protection expenditure.

APPENDIX

CLLASSIFICATION OF ENVIRONMENT PROTECTION ACTIVITIES (CEPA)

1 Protection of ambient air and climate
- 1.1 Prevention of pollution through in-process modifications
  - 1.1.1 For the protection of ambient air
  - 1.1.2 For the protection of climate and ozone layer
- 1.2 Treatment of exhaust gases and ventilation air
  - 1.2.1 For the protection of ambient air
  - 1.2.2 For the protection of climate and ozone layer
- 1.3 Measurement, control laboratories and the like
- 1.4 Other activities

2 Waste water management
- 2.1 Prevention of water pollution through in-process modifications
- 2.2 Sewerage networks
- 2.3 Waste water treatment
- 2.4 Treatment of cooling water
- 2.5 Measurement, control laboratories and the like
- 2.6 Other activities

3 Waste management
- 3.1 Prevention of waste production through in-process modifications
- 3.2 Collection and transport of waste
- 3.3 Treatment and disposal of hazardous waste
  - 3.3.1 Thermal treatment
  - 3.3.2 Landfill
  - 3.3.3 Other treatment and disposal
- 3.4 Treatment and disposal of non-hazardous waste
  - 3.4.1 Incineration
  - 3.4.2 Landfill
  - 3.4.3 Other treatment and disposal
- 3.5 Measurement, control laboratories and the like
- 3.6 Other activities

4 Protection of soil and groundwater
- 4.1 Prevention of pollutant infiltration
- 4.2 Decontamination of soils
- 4.3 Measurement, control laboratories and the like
- 4.4 Other activities

5 Noise and vibration account
- 5.1 Noise and vibration from road and rail traffic
  - 5.1.1 Preventative in-process modifications at the source
  - 5.1.2 Construction of anti-noise vibration facilities
- 5.2 Air traffic noise
  - 5.2.1 Preventative in-process modifications at the source
  - 5.2.2 Construction of anti-noise vibration facilities
- 5.3 Industrial process noise and vibration
- 5.4 Measurement, control, laboratories and the like
- 5.5 Other activities

6 Protection of bio-diversity and landscape
- 6.1 Protection of species
- 6.2 Protection of landscapes and habitats, of which
  - 6.2.1 protection of forests
- 6.3 Rehabilitation of species, populations and landscapes
- 6.4 Restoration and cleaning of water bodies
- 6.5 Measurement, control, laboratories and the like

7 Protection against radiation (excluding nuclear power stations and military installations)
- 7.1 Protection of ambient media
- 7.2 Measurement, control laboratories and the like
- 7.3 Other activities

8 Research and development
- 8.1 Protection of ambient air and climate
  - 8.1.1 For the protection of ambient air
  - 8.1.2 For the protection of atmosphere and climate
- 8.2 Protection of ambient water
- 8.3 Waste
- 8.4 Protection of soil and groundwater
- 8.5 Abatement of noise and vibration
- 8.6 Protection of species and habitats
- 8.7 Protection against radiation
- 8.8 Other research on the environment

9 Other environmental protection activities
- 9.1 General administration of the environment
- 9.2 Education, training and information
- 9.3 Activities leading to indivisible expenditure
- 9.4 Activities not elsewhere specified

CLASSIFICATION OF ENVIRONMENT PROTECTION FACILITIES

1 Protection of ambient air and climate
- 1.1 Dedusting equipment and filters
  Industrial establishments equipped for the treatment of exhaust gases
- 1.2 Air monitoring installations (number of measurement sites by type of compound monitored; number of measurements per year; number of mobile equipment)
  - 1.2.1 Stationary sites in built up areas
  - 1.2.2 Stationary sites in open areas
  - 1.2.3 Mobile sites

2 Water management and protection
- 2.1 Sewerage networks (in kilometres)
- 2.2 Waste water treatment installations (number; capacity in terms of population equivalents of COD)
  - 2.2.1 Mechanical treatment technology (excluding septic tanks)
  - 2.2.2 Biological treatment technology (excluding septic tanks)
  - 2.2.3 Advanced treatment technology
  - 2.2.4 Septic tanks

2.3 Monitoring installations (number of measurement sites; number of mobile equipments; number of measurements per year and by type of water body monitored)

3 Waste management

3.1 Facilities for the treatment of hazardous waste (number, capacity in terms of weight that can be treated by year, by type of waste as applicable)

3.1.1 Physical/chemical treatment technology

3.1.2 Thermal treatment technology

3.1.3 Biological treatment technology

3.1.4 Conditioning of radioactive wastes

3.1.5 Other treatment technologies

3.2 Facilities for the treatment of other than hazardous waste (number; capacity in terms of weight that can be treated by year, by type of waste as applicable)

3.2.1 Physical/chemical treatment technology

3.2.2 Incineration of municipal or similar wastes

3.2.3 Incineration of industrial waste

3.2.4 Biological treatment technology

3.2.5 Other treatment technologies

3.3 Facilities for the disposal of waste (number of sites)

3.3.1 Landfill for all types of wastes

3.3.2 Landfill exclusively for hazardous waste

3.3.3 Containment/underground waste

3.3.4 Other disposal installations

4 Protection of soil and groundwater

4.1 End-of-pipe facilities (number)

4.1.1 Soil surface sealing including ditches and walls, drainage systems

4.1.2 Catchments for run-offs, losses, leaks

4.1.3 Improvement of underground storage and transport facilities in the interest of ground water and soil protection

4.1.4 Removal of underground storage and transport facilities in the interest of ground water and soil protection

4.2 Reservoir liners, reinforcement of transport systems for hazardous products and other integrated facilities [number]

5 Noise abatement

5.1 Noise barriers: roads, railroads, airports (in kilometres)

5.2 Equipment for follow-up and control of noise (number of sites and measurement equipment)

Source: Eurostat 1994.

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