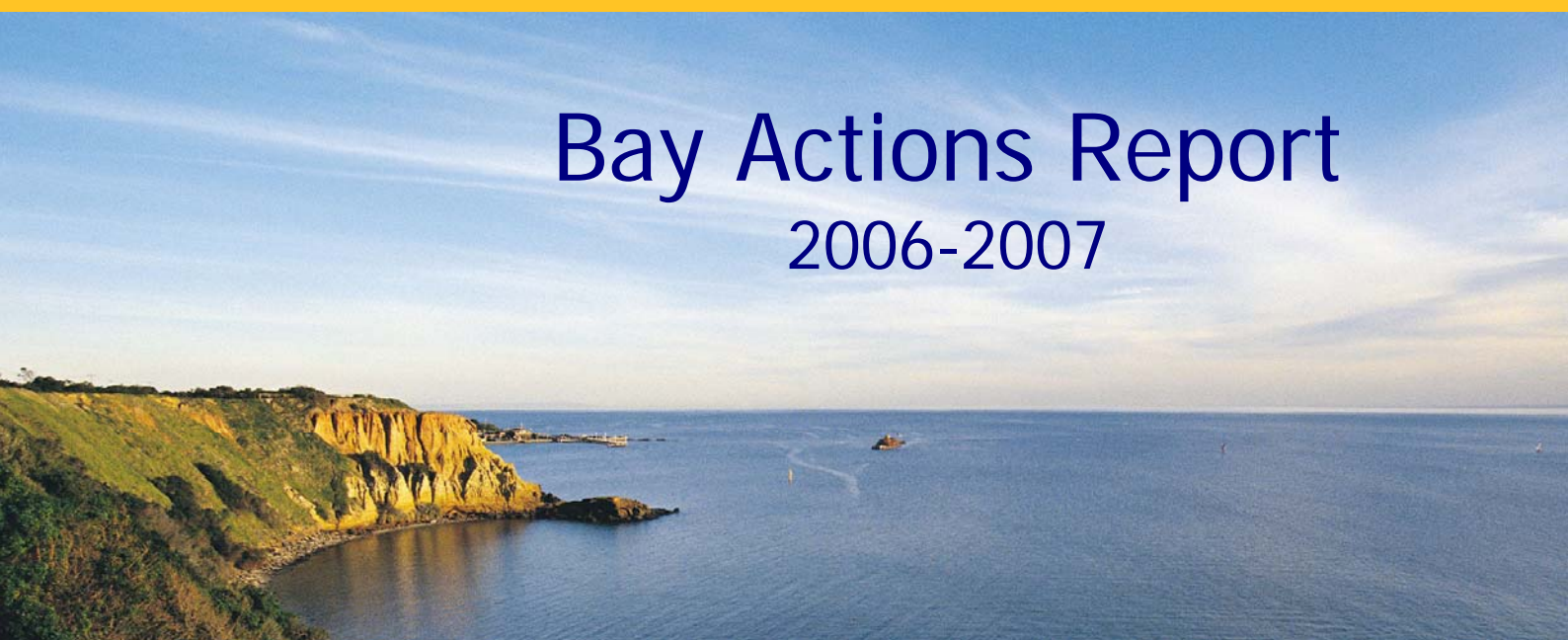


Port Phillip Bay
Environmental Management Plan

Bay Actions Report
2006-2007



This report should be read in conjunction with the Port Phillip Bay Environmental Management Plan (EMP). It is a key element of the EMP's performance reporting framework.

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Introduction

The Port Phillip Bay Environmental Management Plan (EMP)¹ is a key element for implementing the State Environment Protection Policy (Waters of Victoria) - Schedule F6 (the Waters of Port Phillip Bay) (Bay SEPP schedule). The EMP provides a framework for the identification of issues, co-ordination of management efforts, determination of priorities and development of actions to implement the objectives of the Bay SEPP Schedule. The EMP has identified *nutrients* and *marine pests* as the two priority risks to be addressed in Port Phillip Bay (PPB). It also establishes broad programs for mitigating these risks and the environmental management framework surrounding these programs. The Bay Actions Report (BAR) is the EMP framework's key tool for reporting on progress of these programs and achievement of the programs objectives. The EMP Background Document² provides further information on the context for the EMP and its programs, including references to more detailed technical documents.

Each of the EMP's programs has a series of sub-programs and includes:

- objectives for risk mitigation, at program and contributing sub-program levels; and
- sub-program tasks to address the objectives, which range from planning and implementation to coordination, monitoring, reporting and review.

The sub-program tasks are predominantly high-level and long-term, with implementation often involving further planning stages and actions over a number of years. Frameworks are in place for the coordinated monitoring, review and reporting on progress relevant to the objectives of the sub-programs and progress towards mitigating the key risks to the Bay's environment

The BAR was introduced in the EMP as the tool for reporting on progress with EMP tasks *relevant to the Bay itself or to activities or inputs that either affect or enter the Bay directly or are transmitted to the Bay via the oceans*. However, for each BAR to date, it also reports on tasks directly relating to waterway and atmospheric Bay inputs³

The EMP's Nutrient and Marine Pest Management Programs have different reporting frameworks. This is partly due to differences in the nature of these risks, but particularly due to differences in the developmental status of their risk management programs.

Nutrient inputs have long been recognised as an important risk to the Bay's environment, and are a Bay management focus and research issue for the Bay. Marine pest management has a much more recent history, and the EMP's Marine Pest Management Program is acknowledged as developmental.

The understanding of Bay nutrient cycling processes has been built through research culminating in the Port Phillip Bay Environmental Study. The established management of, and research on, nutrient input into the Bay provides for a much more comprehensive nutrient monitoring and reporting approach than is possible for marine pests. However understanding of the complex nutrient cycling processes is not complete. Progressive improvement in the understanding of nutrient cycling is recognised among the EMP's key tasks required to mitigate the Bay nutrient risk⁴.

¹ Department of Natural Resources and Environment 2002a. *Port Phillip Bay Environmental Management Plan: Plan and Critical Programs to 2003*. Department of Natural Resources and Environment, Melbourne, Australia (available at www.dse.vic.gov.au).

² Department of Natural Resources and Environment 2002b. *Port Phillip Bay Environmental Management Plan: Background Document*. Department of Natural Resources and Environment, Melbourne, Australia (available at www.dse.vic.gov.au).

³ It was anticipated in the EMP that reporting on actions addressing catchment nutrient inputs via waterways and drains would also be addressed by *A Catchment Actions Report* (within the Port Phillip and Westernport Catchment Management Authorities (PPWCMA) annual report) and that atmospheric inputs would be addressed under the EPA's *Air Quality Improvement Plan (AQIP)* Reporting System. The PPWCMA's annual report does cover some nutrient input actions in a broader context, but they are presented more succinctly here. The AQIP has not yet been finalized, so the relevant actions are reported here. See Department of Natural Resources and Environment 2002a for further detail, particularly section 3 – Performance Reporting Framework.

⁴ Department of Natural Resources and Environment 2002a. *Section 1 – Nutrient Program* and Department of Natural Resources and Environment 2002b.

Nutrient Reporting Framework

The EMP's nutrient reporting framework is based broadly on a pressure-state-response approach (see EMP Figure 3.1)

Nutrient 'pressures' targeted in the EMP include:

- the Western Treatment Plant;
- other direct nutrient loads;
- catchment waterways (Yarra, Patterson and Mordialloc); and
- atmosphere

Other risks to cycling are also taken into account where identified.

Information about the levels of these pressures in 2006-07 is described in the grey boxes in the relevant subsections of this report.

'State' refers to the condition of the assets we are aiming to protect which, in this case, are the nitrogen cycling processes in PPB. Information about the state of nitrogen cycling processes in 2006-07 is summarized in the report *Port Phillip Bay Environmental management plan: monitoring the State of the Bay nitrogen cycling (2006-07)*⁵.

'Response' refers to progress with implementing the EMP's tasks which aim to reduce the pressures above. This report documents the achievements (responses) of the numerous agencies and their partners during 2006-07 in implementing the Nutrient Program tasks of the EMP. These are described in Appendix 1, where the tasks and their intended reporting outputs are paraphrased. The EMP should be consulted for a full description (page 11).

Marine Pest Reporting Framework

The marine pest reporting framework focuses on progress with implementing the EMP pest framework tasks, which include development of environmental monitoring approaches. The review of the EMP in 2003 found that the tasks were still relevant, and recommended that this approach continue. It was intended that this framework will again be reassessed in the next review of the EMP. Appendix 2 lists Marine Pest Management Program actions and summarises their implementation in 2006-07. The EMP should be consulted for a full description (page 18).

Changes to Institutional and Reporting Arrangements since the EMP

There have been a number of changes to the roles or responsibilities of various organisations since publication of the EMP in 2002. In 2003, the former Department of Natural Resources and Environment (NRE) was split into two separate departments; Department of Sustainability and Environment (DSE) and Department of Primary Industries (DPI). Also, in 2003, the former Catchment and Land Protection Board (CALP) became known as the Port Phillip and Western Port Catchment Management Authority (PPWCMA), with slightly different roles than anticipated in the EMP. These developments should be borne in mind when reading this report in conjunction with the EMP.

The development of a regional Water Quality Improvement Plan for Port Phillip and Western Port, known as Better Bays and Waterways (BBW), jointly funded by Melbourne Water (MW), the Environmental Protection Agency (EPA) and the Natural Heritage Trust's Coastal Catchments Initiative, was initiated in late 2004. MW and the EPA are leading development of the plan, in partnership with DSE, the PPWCMA and other organisations.

BBW is fulfilling the EMP's original planning tasks in relation to catchment and waterway nitrogen inputs (Appendix 1, section 1.3) and it is anticipated that its implementation will provide for continuation of many of the EMP's Nutrient Program tasks into the future and introduce new tasks as appropriate.

Structure of this Report

This BAR should be read as a companion document to the EMP, reporting directly on progress with the sub-program tasks making up the EMP Nutrient and Marine Pest Management Programs. The tasks and their intended reporting outputs are paraphrased here, but the EMP should be consulted for full descriptions (pages 11 and 18).

Most of the EMP's tasks are long-term. Many are also defined at a high-level and their implementation will involve planning and actions over many years. Each consecutive BAR will therefore provide an

⁵ Available at www.dse.vic.gov.au.

update on their implementation. Once a task is completed, it will not be discussed further in subsequent reports.

Both the EMP Background Report⁶ and previous BAR's provide further background information relevant to the EMP programs, sub-programs and tasks. Linkages are also provided throughout this report to websites with further information relevant to the implementation of tasks within the various EMP sub-programs.

⁶ Department of Natural Resources and Environment 2002b

1 Nutrient Program

The Nutrient Program is the nutrient reduction plan referred to in the Bay SEPP schedule. The program focuses on nitrogen, which is the key limiting nutrient for biological processes in the Bay. The sub-programs are described below. Appendix 1 lists the key tasks under each of the Nutrient Program's sub-programs and summarises progress on their implementation in 2006-07.

1.1 Direct Bay Inputs - Western Treatment Plant

The tasks in this sub-program relate to nitrogen discharges from the Western Treatment Plant (WTP). The Western Treatment Plant was upgraded in 2004-05 to achieve a 500 tonne (t) nitrogen reduction.

'PRESSURE' INDICATORS - INFORMATION FOR LONG-TERM ASSESSMENT

Over 2006-07, the WTP's estimated nitrogen load to the Bay over its four licensed outlets, based on results of this monitoring program, was 1560t, with a three year rolling average of 2081t. The 2006-07 load is considerably lower than in previous years, which MW attribute to continued low rainfall during the reporting period, as well as the completion of works in 2004-05. Load reductions are expected to vary inter-annually depending on inflows into the plant (affected by rainfall) and may also be reduced by any increase in the use of recycled water from the plant, however human population increases will lead to increased nitrogen inputs over the longer term. When the maximum annual nitrogen load of 3,100t (as required in the plant's discharge license) is reached, further augmentation or additional recycling will be needed. Because of these variables, a long time series of data will be required to confidently determine the magnitude of the load reduction relative to the agreed 1991-1995 baseline. It is estimated that this data will be available in 2010⁷.

1.2 Direct Bay Inputs – Proposals for New or Increased Nitrogen Loads

The tasks in this sub-program relate to changes to existing discharges of nitrogen or any new proposals that involve the discharge of nitrogen that require approval and/or licensing under the *Environment Protection Act 1970* (EP Act), *Fisheries Act 1995* (FM Act) or *Coastal Management Act 1995* (CM Act).

In reporting on any new nitrogen discharge approvals, it is important to first emphasize that discharge of waste to the environment remains the last choice in Victoria's hierarchy of waste management options, to be considered only after waste avoidance and reuse opportunities have been fully explored. Existing licence holders operate within a context of continual improvement in environmental performance.

EPA works approvals and licences:

New discharges: No works approvals were issued for new licensed Bay nitrogen discharges.

Existing discharges: The Altona Treatment Plant upgrade was completed, resulting in a reduction in nitrogen discharged to PPB from approximately 116t per year to 77.5t per year.

Fisheries licences and permits:

No new licences or permits were issued under the FM Act in 2006-07 that would influence nitrogen loads discharged to the Bay.

CM Act consents:

A list of CM Act consents with the potential to affect nitrogen loads to PPB is given in Appendix 1(B).

⁷ Parslow, J, Sokolov, S. and Murray, S. 1999. Port Phillip Bay: Baseline, monitoring and analysis for nitrogen load reductions. CSIRO Marine Research.

1.3 Catchment Waterways

The catchment waterways sub-program aimed to reduce annual waterway nitrogen load to the Bay by 500t (350t from Yarra/Maribyrnong Rivers; 150t from other surface waters focusing on the Patterson River system) by 2006, particularly focusing on storm event loads where feasible. Due to the many and varied activities contributing to waterway nitrogen loads, and range of management agencies involved, the sub-program is coordinated across three key management themes: Rural Land Management, Stormwater Management and Licensed Waste Discharges.

1.3.1 Rural Land Management

This theme is led by DPI, in partnership with industry, local government and the PPWCMA. It aims to contribute to reducing the waterway nitrogen load by working with agricultural industries to develop and encourage the implementation of sound environmental practices and procedures that will reduce nitrogen inputs from land used for cropping, grazing and horticulture.

Reporting for this theme occurs through the PPWCMA Annual Report⁸ in a broader management context, but more specific detail on nitrogen inputs is presented in Appendix 1.

1.3.2 Stormwater Management

Management of stormwater has been led by MW, with a focus on contributing to the waterway 500t nitrogen reduction target (against the agreed baseline) and preventing, reducing and/or compensating for the future increases in stormwater nitrogen loads (above the designated baseline for the nitrogen reduction target⁹) expected from ongoing urban development within the catchment. The development expected within the next 20 years is expected to lead to annual load increases of 247t, or 136t if accompanied by water sensitive urban design best management practices¹⁰.

It was envisaged in the EMP that MW would lead the planning of stormwater actions. Since the development of the EMP, the BBW planning process has taken over this role, led jointly by MW and the EPA. BBW is scheduled for completion in late 2009.

Reporting on implementation and estimated stormwater nutrient load reductions has been provided by MW to DSE. Targets for future load reductions can be found in the *Melbourne Water Annual Sustainability Report 2006-07*¹¹.

1.3.3 Licensed Waste Discharges

This theme is lead by EPA Victoria. Its planning framework is guided by the EP Act and SEPP's developed under the EP Act (particularly the Yarra and Bay SEPP schedules). It is also guided by EPA's Corporate and Business planning processes. The BBW plan will provide a key tool for work program development.

It was envisaged in the EMP that the PPWCMA would coordinate the reporting of the planning and implementation of these tasks. This has not occurred and reporting has been through the Bay Actions Report.

PRESSURE' INDICATORS - INFORMATION FOR LONG-TERM ASSESSMENT

Nitrogen load reductions from sewerage treatment plant (STP) upgrades and water recycling are relatively predictable, at least for waterway inputs, and are reported in Appendix 1(A), section 1.3.3. For other tools aiming to facilitate and encourage environmentally sustainable waste management, including reduced point-source and diffuse waste discharges, nitrogen load reductions are diffuse and, as for rural land management actions, cannot be meaningfully estimated.

Environmental monitoring is in progress that will, in the long term, provide for assessment of progress with nitrogen reduction targets for the Yarra/Maribyrnong and Patterson/Mordialloc inputs to the Bay (see Appendix 1(A), section 1.3.4).

⁸ PPWCMA (2006) Port Phillip and Western Port Catchment Management Authority 2006/07 Annual Report. Available at www.ppwcm.vic.gov.au

⁹ The Bay nitrogen baseline was established by EPA consistent with the Bay SEPP schedule and consists largely of 1991-5 input loads. More information on the Bay nitrogen baseline is available from EPA.

¹⁰ Sturgess and Associates 2000.

¹¹ Melbourne Water (2007). Annual Sustainability Report 2006/07. Available at www.melbournewater.com.au

1.3.4 Overarching Tools and Mechanisms

This section focuses on tasks within the catchment waterways sub-program which overarch all three of its key management themes. Several of these tasks require long term strategic actions that are difficult to assess in the short term. A number of reporting tasks are not possible because insufficient data is available at this stage.

While general waterway monitoring data are included on the data warehouse, there are no current plans to include storm event data as envisaged in the EMP. A model is required to translate these data into storm load estimates for the major waterway inputs. When enough storms have been sampled to inform such a model, MW will report on this with an overview included in the relevant BAR.

1.4 Atmosphere

This sub-program is led by the EPA. The EPA prepares annual air monitoring reports that assesses society's compliance with the air quality policy. This enables assessment of air quality relative to objectives, informs the development of air quality management strategies and allows evaluation of the effectiveness of air quality management activities.

1.5 Bay Nitrogen Cycling Processes

Tasks under this sub-program relate to monitoring the state of PPB nitrogen cycling and the interpretation of monitoring results. DSE leads most of these tasks and the reporting on their implementation, with the exception of fixed site monitoring (led by the EPA) and any project specific monitoring.

1.6 Reporting on Progress

Tasks and reporting are embedded within the previous sub-programs.

1.7 Progressively Improving Understanding

Tasks and reporting are embedded within the previous sub-programs.

1.8 Review

The Central Coastal Board's (CCB) review of the EMP's implementation was scheduled to commence in 2006 and was at the planning phase during the period covered by this report. DSE is now responsible for the EMP review which is scheduled to commence in 2009.

2 Marine Pest Management Program

The risks of marine pests to the Bay cannot be managed by just focusing on the Bay itself – some of the vectors that can lead to introduction of pests to the Bay operate at scales far larger than the Bay. Consequently, marine pests are most effectively addressed by statewide and national programs. The program for the Bay focuses on key Bay-focused tasks, and forms an additional layer to relevant statewide and national programs.

Marine pest management is the subject of a national management system (National System for Prevention and Management of Introduced Marine Pests), for which arrangements are currently being finalised, and are likely to be implemented in 2009 in domestic ports around Australia. Implementation of the national system will comprise regulations to manage ballast water and rollout of best practice guidelines to key stakeholders to manage biofouling vectors. Victoria is helping to develop the guidelines through representation on the National Introduced Marine Pests Coordinating Group (NIMPCG) and its various working groups. Once finalised, these arrangements will facilitate the implementation of many actions in the Bay EMP.

In the interim, Victoria has worked towards the resolution of some of these issues at the local level through programs such as its own ballast water management protocols, the 6Ds campaign and the aquaculture translocation protocols.

Consistent with the principles of marine pest management¹², this program emphasises prevention of new incursions through management of vectors, but also includes sub-programs on early detection and ongoing management of marine pests.

The Marine Pest Management Program is at an early stage of development relative to the Nutrient Program. Reporting for this program focuses primarily on the implementation of EMP tasks, as opposed to the Pressure-State-Response approach of the Nutrient Program. The sub-programs are described below. Appendix 2 lists the key task under the Marine Pest Management Programs' sub-programs and summarises progress on their implementation in 2006-07.

2.1 Vector Management - Ballast Water

The key task under this sub-program, the development of a ballast water waste management regime, has been in place since 2004. Cost recovery regulations are now in place.

Ballast water arrangements are proposed for implementation in all jurisdictions under the National System in 2009.

2.2 Vector Management - Fouling of Large Ships

The key task under this sub-program is to improve management of biotic fouling of large ships and associated infrastructure to reduce the risk of introduction and dispersal of marine pests.

The existing arrangements for hull fouling continued in 2006-07. Voluntary best practice guidelines are in development based upon the Australian Shipowners Association (ASA) 2006 final report.; *Assessment of Introduced Marine Pest Risks Associated with Niche Areas in Commercial Shipping Draft*.

2.3 Vector Management - Fouling of Small Vessels

The major task under this sub-program is to improve management of biotic fouling of small vessels and associated infrastructure to reduce the risks of introduction and dispersal of marine pests.

Victoria continued its educational campaign for recreational boaters. Best practice guidelines to manage fouling on other small vessels (e.g. commercial fishing boats, ferries, charter boats) are being developed under a National System in consultation with relevant stakeholders.

The Australian Quarantine and Inspection Service (AQIS) regulate to manage risks posed by fouling of small international vessels arriving in Australia¹³.

¹² The three major principles of pest management are, in order of priority:

1. prevention: systems to reduce the risk of introduction and translocation of marine pests (including management arrangements for ballast water and biofouling);
2. emergency response: a coordinated emergency response to new incursions and translocations; and
3. ongoing control and management: managing introduced marine pests already in Australia, where eradication is not feasible.

2.4 Vector Management - Aquaculture

This sub-program covers the movement of live organisms for aquaculture purposes as well as the incidental movement of pest species on aquaculture equipment.

The management framework surrounding aquaculture translocations includes the *Victorian Guidelines for Assessing Translocations of Live Aquatic Organisms 2003*. Protocols developed under these guidelines include: the Victorian Protocol for the Translocation of Blue Mussels; the Victorian Abalone Aquaculture Translocation Protocol; and Management Plans for aquaculture reserves declared under the FM Act. These arrangements are administered by DPI. Blue mussels and abalone are the only species under aquaculture in the waters of PPB in 2006-07.

Under the National System, national best practice guidelines are being developed for management of pest issues in aquaculture translocations. These will be consistent with Victorian arrangements.

2.5 Early Detection

The key task under this sub-program is to monitor priority locations within the Bay for new marine pest introductions. Early detection provides the best opportunity for eradication or control of a newly established pest species. To date, detection of new incursions has relied on reports from marine biologists working in the field and by the general public.

The proposed port monitoring program has not yet been established.

2.6 Mitigate Effects of Introductions

This sub-program incorporates rapid responses to new incursions, targeted research to better understand pest populations and actions to mitigate impacts of established pests.

Control plans for European green crab (*Carcinus maenus*), Japanese kelp (*Undaria pinnatifolia*), European fan worm (*Sabella spallanzani*) are being developed under the National System, and the existing Northern Pacific Sea Star (*Asterias amurensis*) plan will be replaced.

2.7 Reporting on Progress

Tasks and reporting are embedded within the previous sub-programs.

2.8 Progressively Improving Understanding

Tasks and reporting are embedded within the previous sub-programs.

2.9 Review

The CCB review of the EMP's implementation was scheduled in the EMP to commence in 2006. DSE is now responsible for the EMP review which is scheduled to commence in 2009.

¹³ Under the National System, a number of nationally agreed best practice guidelines have been developed (by the Department of Agriculture, Forestry and Fisheries) to encourage small boat operators keep their vessels free of pests and thus reduce the risk of translocations.

Appendix 1: Nutrient Program Actions

Appendix 1(A) – Summary of Nutrient Program Actions 2006-07

This table should be read in conjunction with the Bay EMP's Nutrient Program. Sub-program numbers refer to the relevant sub-program from the EMP. Task numbers are for reference purposes within this document only.

Sub-program 1.1: Direct Bay Inputs - Western Treatment Plant

Task Number	Task	Reporting output	Report	Lead	Key Partner	Target date	Status, end 06-07
1.1.1	Reduce load from WTP by 500 t by 2006.		BAR	MW		2006	Implementation: Completed
		Report on implementation and predicted nitrogen load reduction.	BAR			Ongoing annual (October)	The third environment improvement plan for the WTP has been approved and includes a target to contribute 100t/yr less nitrogen to PPB from constructed wetlands by 2010. Outcome for nitrogen loads is scheduled to be assessed in 2010 as per EMP.
1.1.2	Monitor WTP nitrogen load to enable comparison with baseline ¹ .	Data	To DSE	MW		Ongoing annual	Data is held at MW. MW maintains a monitoring program based on its discharge licence. This data will be used to demonstrate the long-term reduction (comparison with baseline) and is used to prepare MW's annual report to EPA Victoria.
		Estimate of WTP loads.	BAR			2006	The estimated load to PPB for 2006-07 was 1560t; with a three year rolling average of was 2081t.
		Comparison with baseline.				2010	N/A
		Report on results.	BAR			Ongoing annual	On track

Sub-program 1.2: Direct Bay Inputs - Proposals for New or Increased Nitrogen Loads

Task Number	Task	Reporting output	Report	Lead	Key Partner	Target date	Status, end 06-07
1.2.1	Ensure works approvals and licences are consistent with Nutrient Program objectives.	Collate approvals and licence amendments. Include predicted load implications.		EPA	DSE, DPI	Ongoing annual (October)	Altona Treatment Plant (ATP) upgrade was completed in August 2006 and commissioned with a more stringent discharge licence limits coming into effect from January 2007. Approximate nitrogen loads of ATP (t/year) before and after upgrade:

Task Number	Task	Reporting output	Report	Lead	Key Partner	Target date	Status, end 06-07
							v05/06 = 128.5; 06/07 (pre upgrade) = 61.3; 06/07 (post upgrade) = 16.2; 06/07 (combined) = 77.5. It is expected that during the 2007-08 year there will be further reductions in nitrogen discharged to PPB due to full operation of the upgraded ATP in 2006-07.
1.2.2	Ensure CM Act consents & Fisheries Licenses consistent with Nutrient Program objectives.	Collate approvals and predicted load implications.		DPI	EPA	Ongoing annual (October)	CM Act consents: see detailed list in Appendix 1 (B). There are no load estimates due to the difficulty of prediction. Fisheries Licenses: Three land based abalone operations have increased production (increased nitrogen load). Filter feeders are predominant aquaculture species. Current mussel production removes approximately 8tpa of nitrogen from the Bay annually and is projected to increase to 24tpa.
1.2.3	Investigate nitrogen offset system – technical basis & implementation.	Report on progress; potential guideline.	Separate report with summary in BAR.	MW, EPA	DSE, PPWCMA	2008	This project is now a part of the BBW planning process, completion date revised to 2009.
1.2.4	Review Assessment criteria (after investigation).	Updated criteria.		MW, EPA	DSE, PPWCMA	Dependent on 1.2.3 outcomes.	This project is now part of the BBW planning process, completion date revised to 2009.
1.2.5	Scope post-investigation tasks.	Work plan.		MW, EPA	DSE, PPWCMA	Dependent on 1.2.3 outcomes	This project is now part of the BBW planning process, completion date revised to 2009.
1.2.6	Annually compile and report on key implemented actions.	Publish report.	BAR	DSE		Ongoing annual (October)	This report.

Sub-program 1.3: Catchment Waterways

Task Number	Task	Reporting output	Report	Lead	Key Partner	Target date	Status, end 06-07
1.3.1	Rural Land Management Contribute to reducing the waterway nitrogen load to the Bay by 500 tonnes by working in partnership with agricultural industries to develop and encourage the implementation of	Identification of priority land management actions to reduce nitrogen & phosphorous inputs to waterways across the catchment.	Separate reports	MW, EPA	DSE, PPWCMA	2002	Being implemented as the Better Bays and Waterways project (BBW). BBW to be finalised in 2009. Ongoing programs are: <u>DPI Project:</u> The Port Phillip & Western Port Rural Land Management project delivers sustainable land management advice and extension activities to private landholders across the PPW rural landscape which includes Local Government, Landcare and the local community. The project also delivers on-ground works which target the impacts of salinity, delivers EMS activities to local community groups and industry, provides advice on whole farm planning implementation

Task Number	Task	Reporting output	Report	Lead	Key Partner	Target date	Status, end 06-07
	sound environmental practices and procedures that will reduce nitrogen inputs to waterways from land use for cropping, grazing and horticulture.						<p>and undertakes the monitoring of 73 regional groundwater bores. This project is on-going within the Sustainable Landscapes portfolio (major project within Farm Services Victoria).</p> <p><u>DPI Project:</u> The Port Phillip Irrigation project incorporates the Werribee irrigation project described in 2005-06 BAR and is now called 'Sustainable Resource Management in Irrigated Landscapes'. The project, mainly an extension program has installed a demonstration in Bacchus Marsh, using drip lines, which hopes to illustrate a 30% reduction in water use.</p> <p><u>DPI Project:</u> 'Improving the environmental performance of the Victorian Strawberry Industry' – Completed February 2007. Final report located with National LandCare Program, Department of Agriculture, Fisheries and Forestry (DAFF)</p> <p><u>DPI Project:</u> "Identification, evaluation and implementation of agricultural and rural management practices to reduce suspended sediment and nutrient loads to Port Phillip Bay and Western Port". Was incorporated into BBW and a final report was produced in June 2007, DAFF.</p> <p><u>DPI Project:</u> 'GrowWest': report produced by DPI June 2007. It is planned that PPWCMA assume responsibility for this project by end 2007-08. Look at http://www.ppwcm.vic.gov.au/grow-west/ for more information.)</p> <p>The Swan Bay Integrated Catchment Committee (SBICMC) continued fencing and revegetating waterway to improve in-stream water quality reaching Swan Bay and Port Phillip Bay in 2006-07. The 2006 report is obtainable from the Borough of Queenscliff or on the SBICMC website www.corangamite.landcarevic.net.au/groups/swan_Bay/sbicmc</p>
		Development & review of 1-3 yr action plan including (where possible) load estimates.	PPWCMA annual report			Ongoing annual (July)	Being implemented as the BBW project. BBW to be finalised in 2009.
		Implementation of action plan including (where possible) load estimates.	PPWCMA annual report			Ongoing annual (July)	Being implemented as the Better Bays and Waterways project (BBW). BBW to be finalised in 2009.

Task Number	Task	Reporting output	Report	Lead	Key Partner	Target date	Status, end 06-07
1.3.2	Stormwater management Reduce waterway nitrogen load through stormwater action.	Development & review of 1-3 year action plan including (where possible) load estimates.	PPWCMA annual report ¹⁴	MW	DSE, EPA, DPI, local government, CMA's.	2006 Ongoing annual (July)	Stormwater planning is spread across the BBW Plan, Yarra Action Plan, Werribee River Catchment Nutrient Plan and local council stormwater plans. Targets for future load reductions from construction of wetlands can be found in the Melbourne Water Annual Sustainability Report 2006-07. MW has allocated \$20 million to local governments to implement stormwater plans. Projects include rain gardens built through council road improvement activities, contribution towards council wetland projects, and other strategic projects to assist in more sustainable practices such as water sensitive urban design and guidelines. MW has a target to achieve 100t design load reduction by 2010. Additional wetlands have been planned to meet this target. <i>Load implications:</i> Total calculated load reduced through the construction of wetlands is 54.5t.
		Report on the action plan implementation including (where possible) load estimates.	PPWCMA annual report			Ongoing annual (July)	MW reports to the Board annually on progress towards reduction target. Progress on 20 million grants to local government is reported annually in the Yarra action plan implementation report.
1.3.3	Licensed waste discharges Reduce waterway nitrogen load through regulation of licensed waste discharges (i.e. licence requirements & cleaner production).	Development & review of 1-3 year action plan including (where possible) load estimates.	PPWCMA annual report			2006 Ongoing annual (July)	No license changes/new licenses reported in PPWCMA annual report or reported by EPA.
		Implementation of action plan including (where possible) load estimates.	PPWCMA Annual report			Ongoing annual (July)	N/A
1.3.4	Overarching tools and mechanisms.						
	(a) Encourage water sensitive urban design.	N/A. Ongoing strategic		MW, local government.		Ongoing	MW has continued to promote Water Sensitive Urban Design (WSUD) including: <ul style="list-style-type: none"> • maintaining the WSUD website; • implementing the enhanced planning scheme requirements for

Task Number	Task	Reporting output	Report	Lead	Key Partner	Target date	Status, end 06-07
							<p>development (Clause 56.07 in planning schemes requires achieving urban runoff objectives for suspended solids, phosphorus and nitrogen was effected in October 2006); and</p> <ul style="list-style-type: none"> maintaining an offset scheme for non residential development that received approximately \$750,000 to implement projects. <p>Stormwater planning is spread through BBW, Yarra Action Plan, Werribee River Catchment Nutrient Plan and local council stormwater plans. All development sites must comply with the storm water quality objectives in the Best Practice Environmental Management Guidelines for Urban Storm water.</p>
	(b) Consider nitrogen risk in strategic planning.	N/A. Ongoing strategic.	Melbourne Metropolitan strategy	DSE (DOI)		Ongoing	Strategic Action that is difficult to assess in short term (refer to Melbourne 2030).
	(c) Compile key implemented actions affecting nitrogen load, including predictions.		PPWCMA annual report	DSE, DPI			N/A
	(d) Oversee RCS implementation, particularly nitrogen risk.	N/A. Ongoing strategic. coordination role	PPWCMA Annual report	PPWCMA	many	Ongoing annual (July)	An overview of the implementation of Regional Catchment Strategy (RCS) actions in the PPWCMA annual report did not specifically relate to nitrogen risks. A summary of relevant RCS strategic actions are listed in Appendix 4.
	(e) Coordinate development of work plans relevant to reducing waterway nitrogen load.		PPWCMA Annual report	PPWCMA	many	Ongoing annual (July)	Coordination for future planning will occur through BBW.
	(f) Report against the Werribee River Catchment Nutrient plan and the Yarra Catchment Plan.			PPWCMA			<p>No current reports.</p> <p>These plans will be superseded by BBW in 2009.</p> <p>See Section 1.3.1 for details of projects.</p>
	(g) Liaise & provide coordinated program oversight of programs affecting waterway nitrogen across the whole catchment.	N/A. Strategic coordination role.		PPWCMA, CCMA		Ongoing	Strategic action that is difficult to assess in short term.
	(h) Monitor waterway load to enable comparison with baseline for Yarra-Maribyrnong & Patterson-Mordialloc.	Provide data.	Electronic data warehouse	MW		Ongoing annual	<p>Contact MW directly for raw data.</p> <p>MW's storm monitoring program was reviewed during 2005-06. Recommendations from the review included an increase in the number of sites and these will be implemented during 2006-07. The enhanced monitoring will provide data to update the catchment model being developed to estimate loads under the Better Bays and Waterways.</p>

Task Number	Task	Reporting output	Report	Lead	Key Partner	Target date	Status, end 06-07
		Estimate waterway loads.	BAR	MW	EPA, DSE, DPI, CMA's	2003, 2006	There have not been enough storm events since the monitoring program began to make valid estimates of load. Data collection will take longer than expected.
		Comparison with baseline.	BAR	MW	EPA, DSE, DPI, CMA's	2014 or 2016	N/A
		Provide report on results and interpretation.	BAR	MW	EPA, DSE, DPI, CMA's	Ongoing annual. (October)	N/A. Too early to interpret.

Sub-program 1.4: Atmosphere

Task Number	Task	Reporting output	Report	Lead	Key Partner	Target date	Status, end 06-07
1.4.1	Refine atmospheric nitrogen load estimate.		BAR and/or Air Quality Improvement Plans (AQIP)	EPA			Completed in 2001-02
1.4.2	Oversee AQIP implementation including actions relevant to long term nitrogen load reduction.		AQIP reporting	EPA		Ongoing, as per AQIP	<p>The AQIP is still in draft form and there is no immediate timeline for its completion.</p> <p>AQIP is not fully implemented but industry and vehicle emissions are being addressed by alternatives that are designed to improve general air quality and will affect nitrogen load to the Bay. The SEPP (Air Quality Management) requires that all industrial emissions are minimised by best practice applications, including nitrous oxides (NO), from all industrial sources. New motor vehicles have lower NO emissions as Australian Design rules for both passenger and non-passenger vehicles have more stringent emission reduction standards. Consequently NO levels have been reduced from 18ppb in 1997 to 11ppb in 2007.</p> <p>Ambient monitoring undertaken for the SEPP (Ambient Air Quality) shows that while Melbourne has grown in population, ambient concentrations of NO in the Port Philip air shed has not changed significantly.</p>
1.4.3	Collate relevant works approval and licenses, including load implications.		BAR and/or AQIP	EPA		Ongoing annual. (October)	No significant works approval and licence amendments relevant to Bay atmospheric nitrogen load.

Sub-program 1.5: Bay Nitrogen Cycling Processes

Task Number	Task	Reporting output	Report	Lead	Key Partner	Target date	Status, end 06-07
1.5.1	<p>Develop & implement nutrient monitoring program.</p> <p>Establish interagency nutrient monitoring technical coordinating committee.</p> <p>Review nutrient monitoring program.</p> <p>Through research, reduce monitoring uncertainties.</p>	<p>Publish agreed program</p> <p>Provide data as an annual summary of any key results.</p>	<p>BAR</p> <p>Electronic data warehouse</p>	DSE (DPI)	MW, EPA	Ongoing annual. (October)	<p>Nutrient monitoring program is on DSE website. Data held by DSE and Primary Industries Research Victoria PIRVic.</p> <p>Committee ceased to operate in 2005.</p> <p>Nutrient monitoring program was deferred. As a part of the BBW planning process, integrated catchment modelling and Bay condition modelling have been undertaken. (NB. Risks for Nutrient cycling have been considered as part of the Channel Deepening assessment process).</p> <p>DPI Fisheries research project: assessing the impact of declining nutrient inputs on fish production.</p> <p>EPA is writing a report on nutrient cycling and denitrification environmental objectives for PPB through BBW. The report will describe nitrogen cycles in PPB (in context with other nitrogen cycling processes) and develop objectives for denitrification efficiency to be used to assess the health of PPB and to aid in the PPB system management.</p> <p>MW continued its participation in developing the Better Bays and Waterways. Following a public consultation phase, a final plan is expected in 2009.</p>
1.5.2	Maintain fixed site monitoring contributing to integrated program.	Publish data annually.	Electronic data warehouse	EPA	DSE, MW	Ongoing annual.	<p>Monitoring continued though 06/07 and will be increased in frequency and sites during 07/08 due to channel deepening activities.</p> <p>DPI data is published on electronic data warehouse. EPA data available on request.</p>
		Provide summary.	BAR	EPA	DSE, MW	Ongoing in technically appropriate years. (October)	Monitoring report is in preparation. Validated data is uploaded into the EPA Water quality Information System and the State Data warehouse.
		Publish interpretive reports.	Separate report	EPA	DSE, MW	As technically appropriate	A report is currently being finalised.
1.5.3	Review and interpret Bay nutrient monitoring data (other than fixed site data).	Summary reports.	BAR	DSE	MW, EPA	Ongoing in technically appropriate years (October)	Report for 2006-07 is now available on DSE website. The project "Monitoring the State of Port Phillip Bay Nitrogen Cycling" has continued to meet its milestones. Monitoring of denitrification efficiency was carried out at the two key sites in spring and autumn. Continuous water column monitoring has been carried out at three key sites.
		Detailed interpretive	Separate	DSE	MW, EPA	As technically	The interpretive report <i>Monitoring the State of the Bay – nitrogen cycling 2006-</i>

Task Number	Task	Reporting output	Report	Lead	Key Partner	Target date	Status, end 06-07
		reports.	report			appropriate	2007 is available on DSE website.
1.5.4	Implement complementary, peer-reviewed project-specific monitoring programs as relevant.	Public report.	Separate public report	Project proponents	Relevant agencies	As appropriate	The Channel Deepening project was subject to assessment under the Environment Effects Act during this period, which includes a marine nutrient assessment component. Some work has been initiated about determining the impact of channel deepening in increasing available nutrients in the Bay. EPA science unit has been focussing upon the science of understanding reducing nitrogen discharges which may reduce Yarra effluent entering the Bay.
1.5.5	Investigate effects of marine pests on nitrogen cycling.	Summary reports.	BAR	DSE, University of Melbourne		Complete	Combined DSE/DPI Fisheries research project: Building effects of marine pests into nutrient management strategies.
		Detailed technical reports.	Separate report				N/A

Sub-program 1.6: Reporting on progress

See reporting tasks within sub-programs above.

Sub-program 1.7: Progressively improving understanding

Intended to be addressed as an integral component of the sub-programs outlined above.

Sub-program 1.8: Review

Task Number	Task	Reporting output	Report	Lead	Key Partner	Target date	Status, end 06-07
1.8.1	Review progress on Nutrient Program in 2003 (interim) & 2006.	Publish revised critical programs	Separate reports	DSE	CCB, DPI, MW, EPA, CMA, interested parties	2003, 2006	DSE is now responsible for review (previously CCB), which is in planning stages and will commence in 2009.

Appendix 1(B) - Coastal Management Act consents affecting Bay nitrogen loads.

The following is a list of consents that were issued during 2006-07 that may have potential implications for nutrient loads to PPB. The net implications for nutrients cannot be accurately predicted, however their effect on overall nutrient loads to PPB are likely to be negligible.

- Lady of St Kilda Shipwreck Temporary Public Sculpture, St Kilda Foreshore
- Modification and extension to equipment, Corner Point Nepean & St Johns Wood Rd, Blairgowrie
- Trial Breakwater Structure, Shakespeare Grove Main Drain Outlet, St Kilda Foreshore, Elwood
- Replacement of portable amenity block, Stony Point Caravan Park
- Use and Development of Albert Park Yachting 7 Angling Club Extension
- Redevelopment West Beach Pavilion Stage 1) St Kilda West Foreshore
- Major repairs to Cannons Creek Jetty
- Minor Dredging Black Rock
- Rehabilitation works to Cowderoy Street Main Drain, St Kilda West
- Variation to maintenance dredging, Beaumaris Motor Yacht Squadron, Sandringham Beach Park
- Dredging proposal, Mordialloc Creek
- Beach Access Ramp, St Kilda Foreshore
- Minor maintenance dredging campaign in Port waters of Melbourne

Appendix 2: Marine Pest Management Program Actions

These tables should be read in conjunction with the Bay EMP's Marine Pest Management Program. Sub-program numbers refer to the relevant sub-programs from the EMP. Task numbers are for reference purposes within this document only.

Sub-program 2.1: Vector Management – Ballast Water

Task Number	Task	Reporting output	Report	Lead	Key Partner	Target date	Status, end 06-07
2.1.1	Establish ballast water management regime to reduce risks from ballast water proposed for discharge to the Bay.	Annually collate progress	BAR	EPA	DOI, VCA, DSE	Ongoing annual	The Environment Protection (Ships Ballast Water) Regulations were successfully implemented in 2006-07. This included the successful implementation of the cost recovery system. The development of the National Ballast Water requirements was also discussed with the Commonwealth and other jurisdictions focusing on setting the standards for national ballast water management. These discussions will continue until the National requirements are implemented. EPA's position is that support for the proposed National System is conditional on whether it can manage environmental risk to an acceptable standard.
2.1.2	Consider marine pest risks in long-term strategic planning processes affecting port development and shipping patterns in the Bay.			DOI	EPA, DSE, VCA	Ongoing	The Channel Deepening during 2006-07 was being assessed under the Environment Effects Act, which included a marine pest risk assessment.
2.1.3	Advocate action by port and ship managers that helps reduce risks from marine pests.			DOI	EPA, DSE, VCA	Ongoing	Best Practice guidelines have not yet been finalised.
2.1.4	Finalise & implement an EMP to address risks associated with marine pests arising from operation of Port of Geelong.	Publish plan (and periodic reports on implementation).	Separate report	DOI	EPA, DSE, VCA		Completed 2005.
2.1.5	Finalise and implement an EMP to address risks associated with marine pests arising from operation of Port of Melbourne.	Publish plan (and periodic reports on implementation).	Separate report	MPC	EPA, DSE, VCA		Completed 2005.
2.1.6	Investigate and trial appropriate, cost-effective indicators and approaches for monitoring the effectiveness of these tasks at improving management of ballast water.	Report on progress	BAR	DSE	EPA	Ongoing annual (October)	No progress from last report because the National Domestic Ballast Water arrangements have not been finalised. Current timetable indicates arrangements will be implemented by July 2009.

Sub-program 2.2: Vector Management – Fouling of Large Ships

Task Number	Task	Reporting output	Report	Lead	Key Partner	Target date	Status, end 06-07
2.2.1	Assess the feasibility of establishing a hull fouling management regime	Report on assessment and summarise in BAR	BAR	EPA	DOI, VCA, DSE	Ongoing annual	A hull fouling management regime has been examined as part of the National System. National best practice guidelines are under development, and rollout is expected in 2009.
2.2.2	Investigate and trial appropriate, cost-effective indicators and approaches for monitoring the effectiveness of these tasks at improving management of fouling of large ships.	Report on progress	BAR	DSE	EPA	Ongoing annual	No progress since last report. Action depends on progress at national level.

Sub-program 2.3: Vector Management – Fouling of Small Vessels

Task Number	Task	Reporting output	Report	Lead	Key Partner	Target date	Status, end 06-07
2.3.1	Establish risk management to reduce the risk that small vessels and associated gear introduce marine pests to and transfer them within the Bay.	Report on Progress.	BAR	DSE		Ongoing annual	DSE's "6 D's" are distributed upon request. BIA Vic are running a 12 month communications program re reducing risk of pest relocation by small vessel operators, based on national best practice voluntary guidelines.
2.3.2	Investigate and trial appropriate, cost-effective indicators and approaches for monitoring the effectiveness of these tasks improving management small vessel fouling.	Report on progress.	BAR	DSE		Ongoing annual	No progress report available.

Sub-program 2.4: Vector Management - Aquaculture

Task Number	Task	Reporting output	Report	Lead	Key Partner	Target date	Status, end 06-07
2.4.1	Ensure that aquaculture of translocated aquatic biota within the Bay conforms to Victoria's translocation policy.	Annually report on consents issued, conditions & compliance.	BAR	DPI		Ongoing annual	In 2006-07 aquaculture in PPB consists of mussel and abalone farming. Translocations of mussels and abalone for the purposes of aquaculture production are conducted in accordance with the <i>Victorian Protocol For Translocation Of Blue Mussels</i> and the <i>Victorian Abalone Aquaculture Translocation Protocol</i> . Translocation protocols are developed in accordance with the <i>Guidelines for Assessing Translocations of Live Aquatic Organisms in</i>

Task Number	Task	Reporting output	Report	Lead	Key Partner	Target date	Status, end 06-07
							<i>Victoria.</i> No breaches of the protocol were reported in 2006-07.
2.4.2	Ensure marine farming equipment introduced to the Bay is treated to ensure freedom from marine pests.	Annually report on consents issued, conditions & compliance.	BAR	DPI		Ongoing annual	No breaches of the State Translocation Protocol were reported in 2006-07.
2.4.3	Investigate and trial appropriate and cost-effective indicators and approaches for monitoring the effectiveness of these tasks at improving management of fouling of aquaculture.	Report in progress	BAR	DSE, DPI		Ongoing annual	In December 2005, Aquaculture Fisheries Reserve Management Plans were declared under the <i>Fisheries Act 1995</i> for all offshore aquaculture fisheries reserves in PPB. The Management Plans prescribe a range of ecological, economic, social and governance objectives and strategies that reflect their goals. To achieve these objectives, Management Plans prescribe comprehensive performance indicators, reference points and management triggers. No suspected exotic pests were reported under these plans in 2006-07.

Sub-program 2.5: Early Detection

Task Number	Task	Reporting output	Report	Lead	Key Partner	Target date	Status, end 06-07
2.5.1	Design and trial a monitoring system that maintains the currency of information on the status of "target-species".	Report on progress and any new target or exotic species detected.	BAR	DSE	EPA, VCA, MPC	Ongoing annual	No new exotic species were recorded in 2006-07. (Note that during this year reporting of new pest introduction relied on general observations by the public rather than a systematic program dedicated to detecting the introduction of a new pest species). DSE in collaboration with Australian State and Commonwealth Governments, CSIRO and the Bureau of Rural Sciences developed practical monitoring guidelines for the early detection of marine pests in 2005. The practical monitoring guidelines have not been trialled to date.

Sub-program 2.6: Mitigate Effects of Introductions.

Task Number	Task	Reporting output	Report	Lead	Key Partner	Target date	Status, end 06-07
2.6.1	Mount rapid response to the introduction of new pest species	Report on action taken.	BAR	DSE	EPA, VCA, MPC	As required	N/A. No incursions reported in 2006-07.

Task Number	Task	Reporting output	Report	Lead	Key Partner	Target date	Status, end 06-07
	to the Bay where feasible and beneficial.						
2.6.2	Implement and support targeted research to better understand existing pest populations, in particular impacts on nutrient cycling processes.	Annually review program & modify if necessary	BAR		DSE, University of Melbourne	2005	Project completed in 2005, overview report available ¹⁵ .
2.6.3	Implement actions to mitigate impact of established pests, where feasible & beneficial.	Report on action taken	BAR			Ongoing annual	Control effort is focused on preventing the spread of pest marine species. This is achieved by vector management measures described above.

Sub-program 2.7: Reporting on Progress

See reporting tasks within subprograms above.

Sub-program 2.8: Progressively improve understanding

Intended to be addressed as an integral component of the sub-programs outlined above.

Sub-program 2.9: Program Review

Task Number	Task	Reporting output	Report	Lead	Key Partner	Target date	Status, end 06-07
2.9.1	Review progress on these critical programs in 2003 (interim) & 2006.			DSE	CCB, DSE, DPI, EPA, DOI, VCA, interested parties.	2003, 2006	DSE now responsible for the EMP review (previously CCB) which is in the planning stages and scheduled to commence in 2009.

¹⁵ Keough, M.J. *et al.* 2007 Building effects of marine pests into nutrient studies: overview report for the Department of Sustainability and Environment. University of Melbourne.

Appendix 3: List of Acronyms

ATP	Altona Treatment Plant	EPA	Environment Protection Authority
AQIP	Air Quality Improvement Plan	FM Act	Fisheries Management Act 1995
AQIS	Australian Quarantine and Inspection Service	MPC	Melbourne Ports Corporation
BAR	Bay Actions Report	MW	Melbourne Water
BBW	Better Bays and Waterways	N	Nitrogen
CALP	Catchment and Land Protection Board	NRE	(Department of) Natural Resources and Environment
CCB	Central Coastal Board	PIRVic	Primary Industries Research Victoria
CM Act	Coastal Management Act 1995	PPB	Port Phillip Bay
CCMA	Corangamite Catchment Management Authority	PPWCMA	Port Phillip and Westernport Catchment Management Authority
CMA	Catchment Management Authority	RCS	Regional Catchment Strategy
DOI	Department of Infrastructure	SEPP	State Environment Protection Policy
DPI	Department of Primary Industries	STP	Sewage Treatment Plant
DSE	Department of Sustainability and Environment	VCA	Victorian Channels Authority
EMP	Environmental Management Plan	WTP	Western Treatment Plant

Appendix 4: Progress of related Regional Catchment Strategy Actions, June 2007.

Action No.	Description	Percentage complete	Comments
WA6	Map the land-based sources of nutrients, sediments and other pollutants to waterways, PPB and Western Port, and develop and implement a Regional Water Quality Improvement Plan to address the major sources	30%	
WA42	Research the health of and risks to estuaries in the region	60%	
WA44	Implement the PPB Environmental Management Plan with a focus on reducing the annual nitrogen input into PPB by 1,000 t per year and review and extend the plan to address additional risks to the Bay.	N/A	
WA45	Investigate and pilot ways for new nitrogen inputs to PPB to be offset by reduced inputs from elsewhere.	25%	
WA47	Refine and implement actions in Municipal Stormwater Management Plans	10%	Action has significantly advanced since June 2007 with \$20 million allocated by MW to storm water plan implementation by local governments.
WA50	Develop and implement environmental management plans for the region's ports and marinas	50%	
WA53	Develop and implement a coordinated monitoring, evaluation and reporting framework regarding the condition of the region's marine environment, risk and effectiveness of actions.	10%	
LA7	Investigate and promote market based mechanisms that reward landholders providing environmental services	10%	
LA10	Design and deliver programs to achieve adoption of environmental management systems across 25 per cent of the region's intensive agriculture enterprises	20%	
LA13	Ensure that urban design considers landscape and catchment values through the development of performance standards for planning applications and building permits that include water sensitive design and other environmental and catchment parameters	50%	
MA2	Develop and implement regional monitoring and reporting programs for key catchment assets	20%	

N/A = not assessed as at 30 June 2007