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E D I T O R I A L

EDITORIAL

Since our last edition, environmental issues have been widely discussed in the political arena. Recent positive outcomes have included notification of the Government's intention to continue with the National Pollutant Inventory initiative and the release of Australia's first *State of the Environment Report*. Environmental Accounts are also firmly on the agenda of the Australian Bureau of Statistics.

In this edition, we have a further article in the series by Kevin Townsend, of Ernst & Young Environmental, and a report of the Oil Spill Response Review which followed the *Iron Baron* accident. There is also a selection of abstracts of papers presented at the 1996 Australian Academy of Science Fenner Conference on the Environment. The Conference this year emphasised the role of accounting systems and the potential influence of economic indicators and accounting information upon environmental decision-making in both the public and private sectors. An important message was that environmental issues must be addressed on an interdisciplinary basis, and this, as regular readers will be aware, is a fundamental purpose of this Newsletter.

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Corporate Environmental Reporting

Introduction

The objective of reporting on environmental performance is to communicate information on the use of resources (including those that do not belong to an organisation) and the impact of an organisation's activities, products and services on the environment.

Organisations are now disclosing information on environmental performance in their annual reports. Some are going to the extent of issuing stand-alone environmental performance documents. Shareholders are becoming more accustomed to finding social and environmental data within annual reports. Organisations that fail to provide such information may soon find themselves playing catch-up as the environmental reporting process continues to evolve.

Need for Environmental Information

Increased awareness of the state of our environment has resulted in actions that organisations feel have an impact on their ability to:

- obtain financing or insurance at a reasonable cost;
- continue to operate existing facilities or set up new operations;
- continue to compete effectively.

Changes in environmental liability and responsibility have made financial institutions, investors and insurers more discriminating in their choice of individuals and organisations with whom they associate. Financial liability for past, present and future environmental performance cannot be overlooked.

An organisation's operating practices, products, and service delivery can affect its access to customers and its competitive position. Customers will require suppliers to have third-party verification to provide assurance that they have an "active" environmental management system (EMS) in place. Organisations should be aware of how the new ISO 14001-EMS standard can affect their business relationship with their customers.

Market access for goods and services may be restricted by formal and informal barriers. For example, some countries require certain levels of environmental performance to be met before a product can be sold - such as the recycling content of newsprint.

Organisations that take the lead now with environmental strategies for the future will retain competitive advantage. Consumers may also opt to purchase products/services that they believe to be less damaging to the environment. These issues are real and the costs associated with poor environmental performance are starting to add up. Organisations which are perceived to be environmentally responsible will find barriers to doing business reduced, and opportunities enhanced.

Responding to the Business Issues

Because of the constantly changing standards to measure performance, organisations are developing strategic responses to environmental issues, and establishing an environmental management system (EMS) commensurate with their strategy. Four general types of environmental strategy are:

- fix problems;
- comply with laws and regulations;
- adopt comprehensive environmental management practices;
- pursue sustainable development goals.

The type of strategy chosen depends on:

- directors / senior management philosophy toward environmental performance issues;
- stakeholder pressures;
- perceived cost/benefit trade-offs (short-term and long-term) of actions to improve environmental performance.

Organisations that elect to go beyond compliance articulate their strategy in an environmental policy, and, to be credible, support it with specific objectives and targets. Providing information on environmental performance may be difficult for many organisations because they do not have an adequate environmental management system in place to retrieve data. Organisations should start to report on their current position and establish benchmarks to measure future performance.

The first order of business for organisations should be to define their objectives and audiences, as both will influence the content and format of the report. The format could range from newsletters to specific audiences (employees, suppliers, customers or communities) to stand-alone environmental reports.

Corporate Environmental Reporting

EMAS:

The EC in 1993 launched standards dealing with voluntary environmental disclosure in the framework of EMAS (Eco-Management and Audit Scheme) regulation. This regulation is voluntary for industries and requires participants to have a certified environmental management system and to publish environmental reports. Long term entry for overseas exporting nations, such as Australia and New Zealand, into the European market will require a certified environmental management system (EMS) such as ISO 14001 or BS 7750. An EMS requires regular reporting of environmental performance and therefore the EC consumers will, by default, require environmental reports.

Belgium:

In Belgium, as in many other European countries, there is no government regulation obliging companies to disclose environmental information in their annual reports (Nuffel and Lefebvre, 1995). The Belgian government does require certain companies to produce specific environmental reports, and Belgian regional authorities have set up environmental licensing regulations and rules. These rules require certain companies to disclose their production processes, emission levels, and evaluation thereof, personnel involved, etc., in a separate report called an Annual Report Relating to Emission Levels. The report must be sent to the government and works council and can be passed to trade union representatives.

Germany:

In Germany, leading companies in the field of environmental management have applied eco-balancing as a method of improving their environmental performance on a strategic level. Companies compile information on mass and energy balances in order to assess their significant environmental effects and then set quantifiable targets for the improvement of environmental performance (Gelber, 1995). As a result the data requirements for a public environmental statement according to EMAS are directly read from the eco-balance accounts. The development of EMS standards by ISO in the area of environmental performance evaluation could likely result in an increase in eco-balancing in the future as the development of the concept of the operational system and its inputs, outputs and environmental indicators line up with the eco-balances that leading German companies are implementing.

The UNEP study (United Nations Environmental Programme / Industry and Environmental Technical Report No.24) on environmental reporting mentions the German company Kunert as one of the best examples of environmental reporting (over 100 environmental reports surveyed). Kunert is a customer oriented hosiery

and outer garment company (Kunert, 1994). The Kunert environmental report (now in its fifth year) is a stand alone document. The 1994 Report states the company assets used to produce its products (such as land, buildings, plant and equipment), inputs and outputs in the form of environmental data (such as water and energy consumption, resource inputs, packaging, and total waste) and performance indicators (such as specific water and energy consumption and packaging quota). This information is presented to show trends, and the report provides comment on the significance/consequence of the data accumulated and future goals. Commentary is presented that is relevant and easy to follow. The company states its environmental policy and includes a statement that it "does every thing to avoid any possible adverse effects on the environment, and to rectify any damage already caused to the environment". The Kunert environmental report provides information to the consumer in three areas: packaging, product and manufacture. For instance Kunert surveys consumers and advises them on ecological criteria when selecting products in reference to the raw materials which make up the product. In concluding the Kunert report the company publishes a chronological history, starting in 1971, of environmental performance improvements by listing particular initiatives to show commitment to environmental protection.

Australia:

A recent Australian survey of Annual Reports covering the period 1983 to 1992 indicated that the provision of environmental information in financial reports has risen from 46% of companies in 1983 to some 68% in 1992 (University of Tasmania, 1995). The newly adopted interim ISO 14001 environmental management standard did not come into effect until September 1995. As a result one would expect an increase in environmental reporting to develop as companies work towards developing EMS and reporting their environmental performance for compliance requirements and then competitive advantage.

Britain:

The Northumbrian Water Group (Group) is an integrated environmental services business with four major subsidiary companies which:

- provide water supply to 1.2 million customers and sewerage services for 2.6 million customers in northeast England;
- manage liquid and solid wastes;
- provide international consulting services with an environmental focus; and
- manufacture flow measurement and sampling equipment in UK and Germany.

The Northumbrian environmental report is worthy of mention as it provides an example of how water supply and sewerage organisations, operated by local authorities, could and should report on their environmental performance. In a succinct manner, this organisation reports on its aim to improve environmental performance by applying various principles such as the systematic measurement of environmental effects, increased awareness of local, regional and global environmental issues, and the search for environmentally sustainable alternatives to existing practices for the group's businesses and those of its customers. It states that it aims to reduce its consumption of the earth's natural resources and gives preference to use of environmentally benign materials.

It is interesting to note that in its first environmental report (1994/1995) the Group set various objectives and targets. In the current report (1995/96) it states whether these have been met fully, partially or not at all. The Group's environmental report disclosed actual environmental liabilities and cases where it received a prosecution and fine through the Courts. As a result of the Group past performance it set new targets for the 1995/1996 year. These targets include specific environmental audits, extended procedures for measuring resource consumption, no prosecutions through activities generated from its workers / group operations / contractors on site for non-compliance, ISO 9000 for 11

business units and BS 7750 (EMS) for the water and sewerage service subsidiary firm. The main body of the report provides a summary of environmental effects and advises where additional detailed information can be obtained.

The Northumbrian environmental report presents information that is relevant, easy to read and provides the opportunity to obtain further detailed publications on request, without charge. The difference between the British and the German environmental report is the British report does not utilise the eco-balance concept (inputs and outputs). Instead it uses current and existing environmental standards as a base and promotes continuous environmental performance improvement by identifying problem areas and setting targets to reduce waste and improve "eco-efficiency". It then reports this process and the results to stakeholders.

Reporting on Environmental Performance

Framework:

It is useful to apply a general reporting framework to help organisations determine the types of environmental information organisations can report. The vigour with which the framework is applied will define the depth and breadth of information that is ultimately reported. The basic elements of an environmental reporting framework are shown in Figure 1.

Basic Elements:

One of the key objectives of environmental performance reporting is to educate stakeholders about the environmental issues that affect the organisation. Therefore the ***organisation profile*** provides information on operating practices, products and services that may impact on the environment and environmental issues that face the industry. This environmental information must be relevant, understandable, verifiable, complete, and comparable.

Environmental policy, objectives and targets provide a benchmark against which environmental performance is judged other than environmental laws and regulations. External benchmarks will become more important as regulatory authorities move towards emphasising monitoring to ensure their policy and plans are meeting the principle of sustainable management of resources.

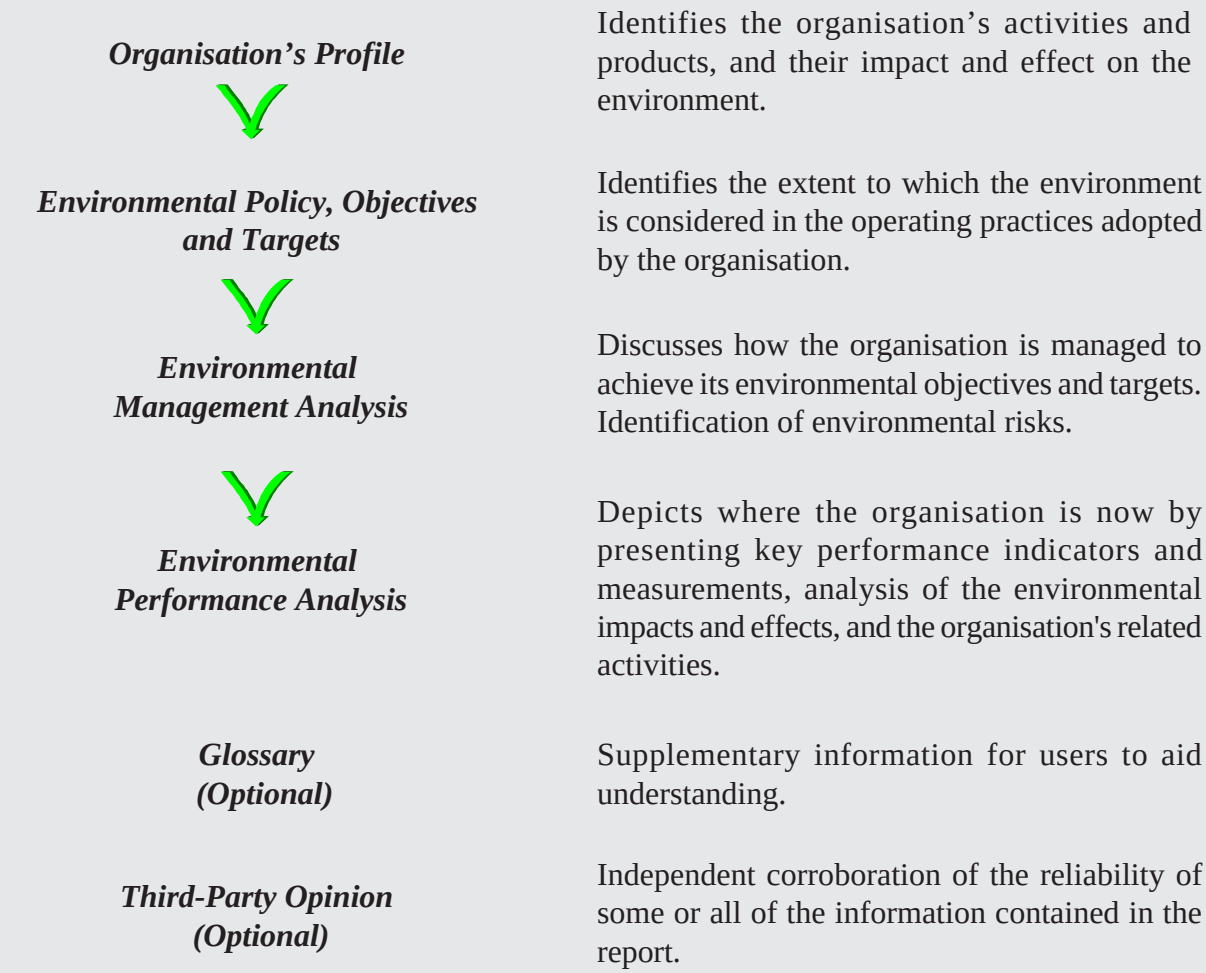
Many stakeholders now seek information about organisation ***environmental management systems (EMS)***. The existence of an EMS provides assurance to stakeholders that environmental matters are dealt with in a systematic manner and that individuals are held accountable for environmental performance. An aspect of accountability is the internal environmental audit and the organisation response to any findings.

The essence of the corporate environmental report is the ***environmental performance analysis***. This report may include an analysis of performance over time or against benchmarks as internal targets and external compliance requirements. It may be organised by line of business, facility, or by environmental media (land, air, water, energy, wildlife, etc.) affected by operations.

A critical element of any analysis is an organisation's ability to provide the data to support its environmental performance claims. Organisations must attempt to identify a few measurements and indicators that provide a balanced view of environmental performance. These performance indicators should be drawn from mainstream business data systems - not only from the specialised environmental management system. The production system, materials accounting system, and financial system may all contain information that is relevant to environmental performance.

Environmental performance data may be enhanced by providing a glossary of terms (to explain industry specific or environmental terms) and a third-party opinion. This third-party opinion may be added when an organisation believes it serves the needs of the audience, adds credibility to the report and demonstrates the organisation's commitment to the environment.

Figure 1 - An Environmental Reporting Framework



[Figure 1 Source - CICA "Reporting on Environmental Performance", A Discussion Paper: Canadian Institute of Chartered Accountants, 1993, Chairman: Mr Randy Billing, Ernst & Young Environmental Consulting Service Inc]

Skills Required

It is important to understand that no individual, function or level commands all the information and knowledge needed to identify and analyse environmental costs in detail (Ranganathan and Ditz, 1996). In order to provide the best environmental reporting and accounting, senior management and cross functional teams are required. For example, to develop credible environmental reports, skills such as environmental (scientific/ecological), legal, purchasing, operations, facilities management, financial, marketing and accounting could be required to provide input into the process of assembling environmental costs and developing quality and practical corporate reports.

In addition, other stakeholder input should be obtained from consumers through product/ packaging/manufacturing, environmental education and consumer feedback. This information is then fed into the reporting mechanism to provide a transparent approach to corporate environmental reporting.

Some of the key factors in environmental management of resources and the successful reporting of environmental performance in the corporate arena are:

- Support from the Board and senior management towards continuous environmental performance improvement;
- Clear understanding by participants of the

drivers leading to reporting;

- Relevant monitoring data and systematic measurement of environmental effects;
- Environmental awareness - ability to present information to reach all stakeholders;
- Commitment to environmentally sustainable alternatives;
- Strength of commitment to report on areas of poor environmental performance and steps the company will take to remedy the situation;
- Dedication to go beyond the minimum requirements to set the standard that competing organisations will work towards.

Although corporate and government authorities have the ability to develop comprehensive corporate environmental reports, there is benefit in companies obtaining independent verification and attestation of progress toward improved environmental management and performance. This is likely to develop as standardisation of environmental disclosures progresses. Currently, there is a movement to develop accounting standards to enable the quantification of contingent liabilities as they relate to existing or potential environmental impacts of an organisation's operations. (ie contaminated site clean-up or resource consent applications in the near future that may require significant funds to meet revised environmental standards).

A particular benefit of securing an external organisation to audit corporate environmental reports is to provide assurance to various stakeholders concerning the level of effectiveness of a company's environmental management programme and how it reports on its environmental performance.

The traditional accounting / management consulting firms have a presence in conducting an independent review of organisation's internal environmental audits and reporting procedures. This type of audit often leads to recommendations for improvement, revisions, and improved auditing procedures. In this instance the tasks involve a review of the organisation's auditing process and not a detailed review of the environmental information results. As corporate environmental reports become more numerous, internal environmental auditing will increase. The more progressive companies will likely gain the higher ground with respect to openness of their environmental performance. Eventually there will be an increase in the use of external environmental auditors and stakeholders are likely to become more sensitive to the value of an external environmental audit. The environmental audit will become a commonplace part of the corporate annual and environmental reports (Epstein, 1996).

Future of Environmental Reporting

Reporting on environmental performance is evolving rapidly and the scale of what constitutes "good" reporting is rising. Information on environmental performance will become standard in annual reports and for clients in industries that have the greatest impact, or potential impact on the environment. Stand-alone environmental reports will also be commonplace.

Organisations must make informed choices now on how they will communicate their environmental performance, what information is currently available, and where the information gaps exist and how to bridge them. ***Start Now*** - reporting information that is currently available. Derive a plan to develop systems and measurements, and determine how best to present the information now and in the future.

In New Zealand, Landcare Research New Zealand Ltd (Bebbington, 1996) is conducting an experimental environmental accounting project which attempts to calculate the financial cost this organisation would incur if its operations were environmentally sustainable. This project will attempt to quantify various aspects of environmental impacts to determine the true (or close to true) environmental cost of its services. The benefit will be the development of a methodology and process to investigate all activities of this organisation which will provide

valuable information to environmental policy decision makers on the cost to achieve true sustainable management of the physical and natural resources by considering resources on a global scale (ie fossil fuel use and cost of utilising generally more expensive, but less harmful alternatives).

A system of integrating economic and environmental indicators and accounts is needed. This will address the problems of the various economic sectors and policy fields at various levels. The ultimate goal would be the integration of environmental and economic accounting in national accounts (GNP). The introduction of EMS in the corporate and public sector marketplace will ultimately drive the growth in corporate environmental accounting. A logical extension is the introduction of environmental accounting to place a financial perspective on whether organisations and ultimately the nation are truly on the path to sustainable management. In the future there will be a need to demonstrate that we are utilising the physical and natural resources in the most efficient manner.

In the past, organisations could go out of business according to economic rules. In a sustainable future, this could, and will, still happen, but it is surely likely that organisations failing to comply with environmental legislation and to satisfy environmentally educated consumers, will also go out of business (Birkin, 1996). It is hard to find a nation, central government or regional government that doesn't believe in sustainable development. As the reporting of the measurement of environmental effects and the ecological and financial cost of these are quantified we will understand the true (or nearly true) cost to achieve a sustainable environment. The interesting outcome will likely be a balance between economic growth of underdeveloped nations and environmental devastation - or a slowing of economic growth in developed nations as we take responsibility to pay more for our consumer goods and services in order to contribute towards sustainable management of our resources.

For many years environmental groups, academics, regulators, individuals and the business community have expressed concern about nature's ability to cope with current business activities. The expectations of environmental performance and environmental management of physical and natural resources are rising. Organisations must be sensitive to changes in environmental awareness to respond promptly and provide balanced environmental reports to inform stakeholders who include employees, creditors, investors, consumers, regulatory bodies, and environmental interest groups.

Conclusions

Before an organisation acts on the development of a corporate environmental reporting process it needs to know what information needs to be reported. This is generally a reflection of community requirements and expectations. The community extends from the small rural township to the global environment. Organisations who act responsibly to reduce waste and move towards sustainability of resource usage, report their efforts in corporate environmental reports which are relevant, understandable, verifiable, complete and comparable. This process tends to drive up the environmental high ground for other reactive organisations to follow.

Current and future stakeholders such as employees, investors, community, customers, activists, media, government, suppliers, and the organisation entity itself all benefit from reporting on environmental performance.

In New Zealand, Regional Councils and Territorial Local Authorities (District and City Councils) are nearing completion of the development of planning and policy statement requirements under the Resource Management Act 1991, and moving toward increased monitoring and compliance activities. This leads

to the need to develop environmental management system to suit, and to environmental reporting for legal compliance requirements. The future will see a move toward the integration of environmental performance measurements with environmental accounting thus shifting business towards sustainable management of resources.

The future is for increased communication, and corporate environmental reporting has the ultimate benefit of providing information to stakeholders to provide a benchmark and to enable this information to be utilised as a part of a decision making tool for achieving future sustainability of the earth's environment.

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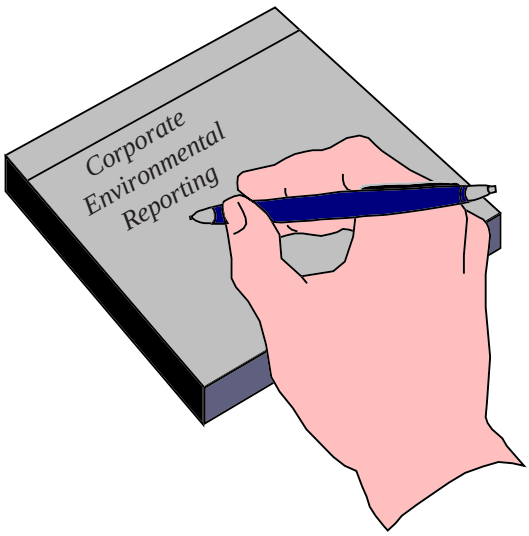

The Iron Baron: Oil Spill Response Review

The *Iron Baron* Oil Spill Response Review Recommendations were tabled to the National Plan Advisory Committee meeting on 9 February 1996. These recommendations followed on the grounding of the BHP owned *Iron Baron* on the Hebe Reef at the mouth of the River Tamar in Northern Tasmania on July 10 1994. The 37,000 tonne vessel subsequently leaked 5550 tonnes of bunker oil and was later scuttled in Bass Strait by the salvors.

The Review Group undertook a wide ranging review into the National Plan response arrangements, following the *Iron Baron* grounding. The Group reviewed all aspects of the oil pollution response including the release of oil following the grounding and refloating and assessed the response for any deficiencies in the National Plan to Combat Pollution of the Sea by Oil (NATPLAN), and in the actual response. An earlier media release by the Australian Maritime Safety Authority of 22 December 1995, summarised the Review Group's recommendations to the Federal Minister of Transport, the Hon. Mr Laurie Brereton, and the Tasmanian Minister for the Environment and Land Management, the Hon. John Cleary.

The Chairperson of the Review Group, Mr Tim Muir, Navigation and Environmental Services Manager, Port of Melbourne Authority, described the response to the oil spill as one of the largest ever mounted by NATPLAN, and the first major test since it was revised following a comprehensive revision in 1993.

The Review was intended to support the requirement in the revised NATPLAN that in case of any future major incident the spill response would be reviewed to ensure that the lessons learnt would result in improvements to future responses.

Mr Muir concluded that while a number of improvements could be made to assist any future cleanup operation, the *Iron Baron* spill response was generally well planned, managed and sustained. Equipment and personnel resources were effectively used and planning the response in an operational priority sense was well managed. The On-Scene Coordinator, Port of Launceston Harbour Master Captain Charles Black and his team were deserving of special recognition. The good work was also acknowledged of the State Marine Pollution Committee and other Tasmanian departments and agencies, the Australian Maritime Safety Authority (AMSA), the Australian Marine Oil Spill Centre (AMOSC), private companies and businesses, the large volunteer contingent of workers, and active members of local communities.

The NATPLAN Terms of Reference were to:

"1. Assess the response by the Operations Control Committee with particular reference to:
   (i) call-out procedures used and the adequacy of the initial and subsequent response;
   (ii) the suitability and accessibility of NATPLAN equipment and response capability generally;
   (iii) availability and timeliness of technical support;
   (iv) the decisions made in respect of calls for equipment and personnel in regard to adequacy and timeliness;
   (v) the adequacy and timeliness of the wildlife rescue and rehabilitation response:
   (vi) the adequacy and effectiveness of plans made for responding to the incident and their implementation;

(vii) the adequacy of the administrative support, environmental advice and support, and other related activities;
(viii) the interaction with the media and other interested parties;

2. Assess the involvement of the AMSA, the Tasmanian State Committee and other parties from the viewpoint of appropriateness, timeliness and adequacy. In this regard, particular attention should be given to the inter-relationship between the three tiers of government involved in the incident response and the role of the spill commander.

3. Assess the actions taken by the BHP Transport Group and the Port of Launceston Authority.

4. Within the context of this incident, review the national, Tasmanian state and local contingency plans, and report on the adequacy of each. In this regard the working group should also address such issues as:
   (i) safe haven issues and implications;
   (ii) relationship with environmental agencies;
   (iii) the role of volunteers; and
   (iv) BHP, salvor and government interaction in relation to the response to the incident and the final decision to scuttle the vessel.

5. Provide recommendations for improvements and initiatives based on the lessons learned from the incident."

The Review Group's recommendations on the *Iron Baron* oil spill response included the following main points:

"Powers of Intervention, Legislation and Jurisdiction

1. To ensure an unambiguous identification of powers between States and the Commonwealth, the Tasmanian Government and other States and the Northern Territory should review their future needs to exercise powers of intervention either through State/ Territory legislation or by seeking delegation from the Commonwealth Minister for Transport under Commonwealth legislation.

2. The Tasmanian Government should review pollution legislation with a view to removing the requirement for the Minister for the Environment and Land Management to approve an individual incident response plan and for the State Committee to appoint an on scene co-ordinator.

3. The Tasmanian Marine Boards should examine appropriate delegations/ authorisations of navigation powers beyond port limits to allow for immediate direction to be given in the event of an emergency incident.

Contingency Plans

4. Tasmanian State Contingency Plan and regional/port plans should be reviewed and aligned with National Plan contingency plan guidelines. Each port contingency plan should identify local government shoreline clean-up roles and responsibilities.

5. State and the Northern Territory Pollution Committees should examine the appropriateness of identifying the government department with statutory responsibility for wildlife as a 'primary' agency within their contingency plan.

Role of the State Committee-links between State Committee and Response Planning Committee

6. The Tasmanian State Marine Pollution Committee should consider appointing an Executive Officer to relieve the current State Oil Pollution Control Officer/Scientific Support Co-ordinator of administrative responsibility to the committee, and review the availability of direct scientific support to the Committee. This could be done by the establishment of regional environmental experts for each port contingency plan.

Coastal Resource Atlas

7. The Tasmanian Coastal Resource Atlas should be developed as a high priority. It's compilation should include input from relevant government and non-government institutions and organisations.

On Scene Spill Model

8. Given the present limited capability of the National Plan's On Scene Spill Model, it is essential to place great emphasis on regularly ground-truthing predictions.

9. National Plan Funding should be made available to continue development of an improved Oil Spill Trajectory Modelling System including the retrieval of up-to-date and detailed base-line data.

10. Any National Plan information should include details of the limitations of predictive modelling.

The Response Planning Committee

11. National Plan State and Northern Territory Committees should ensure that potential regional Operations Centres are identified in contingency plans.

12. The Australian Maritime Safety Authority's proposal to establish a National Response Team should be pursued as a matter of priority.

13. Tasmania should review the current arrangement that identifies the position of Oil Spill Commander with the Commissioner of Police.

Equipment

14. The Tasmanian Marine Pollution Committee should review its equipment stockpile and identify any shortfalls, taking into account:
    (i) types of oil - ie, predominance of heavy bunker fuel oils,
    (ii) exposure to prevailing weather/water temperatures,
    (iii) transportation of equipment logistics.

15. Given the shortcomings of some existing equipment, more resources, both personnel and monetary, should be allocated to the research and development of response equipment, with particular emphasis on equipment that has been identified as needing modification.

16. Appropriate wildlife rescue and rehabilitation kits should be included in any pool of response material and also be made available at key locations around the country under the National Plan.

Shore Line Clean-up

17. Port/Regional contingency plans should identify senior local government engineers who should receive appropriate training to be shoreline clean-up team leaders.

Dispersant Use

18. The National Plan Advisory Committee must give high priority to the establishment of a dispersant/temperature/oil type matrix as a matter of urgency using contract services if necessary. This matrix should be kept updated and be incorporated in all State and Regional Plans.

Disposal of Waste

19. Regional and Port contingency plans be reviewed and updated to reflect current preferred practices and on the identification and implementation of disposal methods for oily waste and liquid oil.

Salvage-Operations

20. During an incident where casualties being salvaged have caused or are likely to cause pollution, the Lead Agency should appoint a senior representative who remains on board, with the objective of providing best available information on a continuing basis to the On

Scene Co-ordinator and others. It will also be beneficial to the Salvage Master having to brief only one representative. The duties of this position need to be fully considered and developed with the formation of the National Plan Response Team. This is a key position and consideration needs to be given to the training and experience of the personnel likely to be filling this role.

21. During an incident, independent salvage advice may need to be provided to the On Scene Co-ordinator, State Marine Pollution Committee and to the Australian Maritime Safety Authority. The Australian Maritime Safety Authority should explore the availability of resources to provide independent salvage advice and make arrangements to ensure that this independent opinion is available during an incident involving any severely damaged casualty.

Trainings/Briefings

22. National Plan agencies in each State and in the Northern Territory should prepare a series of relevant hand-out materials which should be immediately available to all newcomers to a site, particularly volunteers and untrained/inexperienced personnel on matters including wildlife handling, shoreline clean-up and handling dispersants. These would be supplementary to the job training.

    There must be an effort to educate across the spectrum of disciplines involved in an oil spill response so that a better understanding of relative priorities, concerns and response exist.

23. Tasmania should establish a regular program of operator training courses for port, lands/ wildlife, local government and emergency personnel.

Wildlife

24. A senior Wildlife Manager with a clearly identified role and responsibility should be included on the Response Planning Committee for all future oil spill incidents in Australia from the outset and identified as a key functional position within contingency plans.

25. The Tasmanian Parks and Wildlife Service should prepare a Wildlife Response Plan.

26. A National Wildlife Response Plan should be pursued as a matter of priority and included as part of the National Plan to Combat Pollution of the Sea by Oil.

Aquaculture/Fisheries

27. The Communication outlines in Regional and State Plans should be amended to clearly identify:
    (i) the appropriate public health/fisheries spokesperson,
    (ii) better dissemination of information to the public on health impacts of an oil spill on aquaculture and fisheries.

Post Spill Assessment

28. Impact assessment should continue along lines determined by the Impact Assessment Group of the Tasmanian State Marine Pollution Committee, including the provision for amending the program in the light of results obtained from ongoing work. Results of this assessment should be publicly available.

Community Issues

29. Consultation with and involvement of the local community in relation to an incident to be targeted specifically, throughout the entire operation and beyond. This should be an ongoing priority for the Planning Group.

Cultural and Heritage Issues

30. Future State/Northern Territory and Regional Plans should have regard to cultural and heritage issues including:
    (i) procedures for liaison and consultation with Aboriginal communities
    (ii) procedures to identify Aboriginal and

European cultural heritage sites which might be impacted.

(iii) identification of impacts on traditional practices.

(iv) any existing legislative requirements."

Conclusion

The lessons of the *Iron Baron* casualty are still working their way through the administrative and technical response systems. Although the *Iron Baron* spill was small by international standards it was one of the more serious within port administered waters in Australia. The State, Territory and Federal Governments' reaction to the recommendations of the Oil Spill Response Review will need to be carefully monitored not least in the light of the current climate of budgetary cut backs at all levels.

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Fenner Conference Report

The 1996 Australian Academy of Science Fenner Conference on the Environment was held at the Institute of Environmental Studies of the University of New South Wales from 30 September to 3 October 1996. Its theme was *Linking Environment and Economy Through Indicators and Accounting Systems*, and over sixty papers were presented in plenary and concurrent sessions, in addition to two excellent briefing papers by Carolyn Hendriks & Ronnie Harding of the Institute of Environmental Studies, and Roger Burritt of the Australian National University.

Conference participants included accountants, economists, statisticians, scientists, environmental managers and politicians, and the paper topics, whilst all addressing different aspects of environmental economics and accounting, were reflective of this broad range of interests. As a result of the diversity of both participants and presentations, some very animated informal discussions were engendered, and Dr Ronnie Harding and her team at the Institute of Environmental Studies are to be congratulated for their nurturing of an immense cross-fertilisation of ideas across all disciplines.

Senator Robert Hill, Commonwealth Minister for the Environment, gave the opening address. He identified a key issue of "how do we measure environmental change flowing from our interference with natural processes and how do we account for that change to present and future generations?" He pointed out that it is the basic life support systems of the planet that underpin our material wealth, and it is their protection that will present the most profound challenge for humankind throughout the early part of the next millennium. The following statistics were provided:

> "Since the beginning of this century, the world's population has grown from just under 2 billion (1.8 in 1900) to nearly 6 billion (5.8).
>
> If ... we continue the growth in consumption of fossil fuels to a point where other nations emit the same level of greenhouse gases per capita as we do, and given that the world's population is

predicted to grow another 30% to 8 billion by 2025, carbon dioxide concentrations in the atmosphere will exceed 200% of pre industrial levels.

Even under conditions of moderate population growth and economic expansion, computer models suggest that increases in atmospheric concentrations may lead to an increase in global temperatures by 2 degrees over the next century - with major detrimental consequences.

This exploitation of resources has also led to a crisis in the loss of its biological diversity. A number of eminent scientists ... have concluded that perhaps 25% of the earth's total biological diversity is at serious risk of extinction in the next 20-30 years"

The Senator pointed out that in a recent poll conducted by the Australian Bureau of Statistics, over 70% of people over the age of 18 believed that protecting the environment was as important as economic growth. In attempting to meet public expectations, the government intends to build upon the 1992 *National Strategy for Ecologically Sustainable Development.* We were reminded of two of the guiding principles of the National Strategy:

- *"decision-making processes should effectively integrate both long and short term economic, environmental, social land equity considerations"*, and
- "*cost-effective and flexible policy instruments should be adopted, such as improved valuation, pricing and incentive mechanisms"*.

It was these issues that many of the papers presented at the conference sought to address, and the following is a small sample of abstracts of those papers.

Measuring the Environment: The Availability and Use of Environmental Statistics in Australia: Clive Hamilton (The Australia Institute and ANU) and Roger Attwater (Centre for Resource and Environmental Studies, ANU).

The flourishing of concern for the impact of human activity on the natural environment has brought a boom in the generation and use of statistics across a broad range of environmental areas. Considerable resources are devoted to generating statistics, and it is important for providers to know whether the statistics they are providing are those in strongest demand by the using community. In some cases the generators and users are the same people or organisations and there is no mismatch. In other cases, users directly commission numbers from providers and there is little mismatch. But a large proportion of environmental statistics are generated by organisations for a wide variety of users.

This paper reports the results of a study of the availability and use of environmental statistics in Australia. The study was motivated by the need to bring, as far as possible, the provision of environmental statistics into harmony with the needs of users of those statistics.

Are Indicators Yesterday's News? Roger Bradbury (Bureau of Resource Sciences, Canberra).

This is Sydney, so here is some scientific Sydneyana: Harry Recher's famous correlation between two indicators, bird species diversity and foliage height diversity. Harry, of course was the first ecologist at the Australian Museum, and this figure was considered terribly important at the time. Even now it shows a certain naive charm. But we must be gentle, and remember that it was 1969, that diversity was a hot number in theoretical ecology circles, and that many of us thought that we were closing in on the answers to the big questions of ecology.

That we were wrong is due in part to hubris, the constant companion of all theoretically inclined scientists, but it is also due in part to a belief that we could substitute measurement for understanding. That we could lazily capture

understanding the way we capture images on a photograph, by clicking a button - in this case, the button on one of the new programmable calculators that were just then coming on to the market.

Now I am not going to propose that we all lay our problems with indicators at the feet of Hewlett Packard and Texas Instruments, because they produced calculators that make it easy to calculate diversity indices. But I am going to say that they made it easy for us to play with indicators, to fall for their seductive charms, to create a sad Cartesian parody: *Indico, ergo sum.*

Money Under the Mattress: The Hidden Wealth of Microbial Biodiversity, Michael Gillings (Key Centre for Biodiversity and Bioresources, Macquarie University).

In any environment, the most numerous living things are micro-organisms. This microbial world encompasses many life forms, including bacteria, fungi, protozoans and single-celled algae. Micro-organisms drive ecosystem processes such as the carbon, nitrogen and methane cycles. They are found in all places where life can exist, from the frozen poles to the hottest deserts, in the deepest oceans and at extremes of pH and salinity. The combination of their central role in ecosystems, together with their widespread distribution and vast numbers, makes them ideal candidates for use as universal indicators of ecosystem health. It is the aim of this paper to demonstrate the ways that assessment of microbial biodiversity might help to answer key questions in environmental monitoring, and to show the value of microbial diversity to biotechnology and bioremediation projects.

A Critical Perspective on the Development of European Corporate Environmental Accounting and Reporting, David L. Owen (Department of Accounting & Finance, University of Sheffield, UK).

For those few stalwarts who have promoted the cause of social accounting research throughout the barren period of the 1980's 'greed is good' decade, the recent explosion of academic and professional interest in the problems of accounting for the environment has undoubtedly been most welcome. Indeed, the increasing willingness of the accounting profession in Europe to become involved in the development of environmental accounting theory and practice stands in sharp contrast to its earlier general aloofness from the widespread experimentation and debate concerning social accounting in the 1970's. Should this professional interest be maintained the prospects of environmental accounting suffering the fate of its predecessor are, of course, much diminished. There is, however, at the present moment, little ground for complacency....

Corporate Environmental Reporting: The Next Tool for Environmental Gains? Helen Hofman (Manager Environmental Reporting, NSW EPA)

There has recently been a surge of interest in the field of Corporate Environmental Reporting (CER), that is, the practice of an organisation publicly disclosing the impact of its activities on the environment and its performance in managing its impacts.

The NSW EPA is keen to promote CER as it sees reporting by both public and private authorities as potentially the next important tool for environment protection. It has the capacity to give us both large environmental gains and also to increase the efficiency and competitiveness of New South Wales industries.

There are many stakeholders in the promotion of CER, including environmental groups, local community groups, ethical investment associations, professional accounting associations and several government agencies. This paper presents the perspective of the NSW EPA, although it will attempt to demonstrate that the objectives of most stakeholders complement each other, and will be most effective if stakeholders work together.

Review of Materials Accounting Measures for Tracking and Improving Environmental Performance, Stephen Moore (School of Civil Engineering, University of New South Wales) and Paul Brunner (Department of Waste and Materials Management, Technical University of Vienna).

This paper provides an introduction to the importance of understanding the flow of materials through processes in regions, indicating the questions that need to be addressed if sustainability from a material management perspective is to be achieved. Three major materials accounting techniques are then reviewed and the particular applications that each has is highlighted.

Materials Intensity per Service Unit (MIPS), Materials Flux Analysis (MFA) and Life Cycle Assessment (LCA) have been used for over a decade and are developing data bases and case studies which demonstrate their usefulness. Other techniques are briefly noted. It is concluded that all three major techniques have complementary uses for addressing regional environmental problems, and can be integrated with other environmental management techniques.

Mandatory Reporting: A Trojan Horse?
Jerrold Cripps QC, (Special Counsel to Allen Allen & Hemsley).

With the significant increase in environmental prosecutions and the potential for personal liability of directors and managers of corporations, there is a sharpened focus on the methods by which corporations can protect the confidentiality of sensitive information which may be used against them by regulatory authorities such as the EPA.

The recent trend towards the implementation of environmental management systems, particularly since the release of draft ISO 14000, has led to an increase in the documentation generated by corporations. This has included documentation containing information relating to environmental offences and licence breaches, which, although valuable as a management tool, may contain information which is prejudicial to the corporation's interests. In some cases, environmental prosecutions have been instituted on the basis of information generated by the corporation, which has fallen into the hands of the EPA.

The improved knowledge which corporations are able to obtain as a result of comprehensive reporting systems is of great use as a preventative means against future contraventions, and should be encouraged. However, corporations should also ensure that in generating such information, appropriate measures are in place to protect, as far as is possible, the confidentiality of sensitive information.

This paper addresses the mandatory reporting obligations imposed on corporations and discusses the circumstances in which such information can be protected.

Corporate Environmental Performance Indicators: Cost Allocation - Boon or Bane?
Roger L Burritt (Department of Commerce, The Australian National University).

This paper addresses the following issues:

(i) the reasons for cost allocation - contrasting information accuracy and behaviour influencing views;
(ii) the areas where cost allocation has an impact on corporate environmental performance; and
(iii) whether and how cost allocation can be used in a pro environmentally benign manner by corporations with environmentally sensitive activities.

It concludes that cost allocation can be used in combination with non-financial environmental performance measures to influence corporate environmental behaviour in a pro-environmental manner. Finally, the paper suggests that further research is needed on the development of generic environmental risk classes to which cost

allocation weightings can be linked.

Contaminated Sites: The Concealed Risk in Financial Reporting, Kathy Gibson (Department of Accounting & Finance, University of Tasmania).

Corporate financial reports currently reveal little information about liabilities and potential liabilities for contaminated site remediation. This is partly the result of the narrow concept of "liability" adopted by the accounting profession, and a lack of guidance from accounting standard-setters. In the absence of standards, companies are not willing to reveal information on an individual basis which they perceive may be detrimental to them.

This paper reviews the problems and potential extent of concealed costs, together with some of the reporting issues and guidelines provided by non-accounting and overseas bodies. It concludes with a proposal for an accounting standard designed to provide uniform disclosure of actual and potential environmental liabilities.

Assessing Agricultural Sustainability, Judy Caughley (National Collaborative Project on Indicators for Sustainable Agriculture).

In 1992, the Standing Committee on Agriculture and Resource Management set up an Expert Group to investigate and develop a system for reporting to federal and state governments on the sustainability of agriculture. After much deliberation, the Expert Group decided that four components were the primary determinants of agricultural sustainability - (a) long-term net farm income, (b) land quality, (c) managerial skills and (d) off-site impacts. They proposed a set of attributes that might be used to quantify these indicators.

The Standing Committee then set up a National Collaborative Project for Indicators of Sustainable Agriculture and a 'Field Testing Group' whose first task was to examine the feasibility and suitability of the attributes proposed by the Expert Group. The re-evaluation has recently been completed and this paper reports on the final choice of attributes. It also describes how they might be linked to give an overall assessment of agricultural sustainability.

An Update of Capital Maintenance Concepts for Agricultural Accounting, Patricia Evans (Department of Accountancy, Royal Melbourne Institute of Technology)

In agriculture, accounting and new technology can mask the true effects of soil degradation. Two areas of management in agriculture, but not yet of accounting, are natural resource capital (capital maintenance), and information capital (intellectual capital). Both resources are implicitly included in accounting but only through its economic rationale of market price. In fact, increasing yields and profits are not necessarily maintaining or enhancing the economic viability of an entity or the natural resource base. The components of the total economic transaction have more factors than the capital maintenance accounting theory currently recognises. Incorporation of those factors will make a more comprehensive and accurate description of the reality of resource usage. Initially, social accounting, and later environmental accounting, drew attention to both entities which were not being measured and which were not acceptable within the conceptual parameters of accounting theory. This paper will discuss the implicit and explicit contributions capital maintenance concepts can make to both natural resource capital and information capital.

Valuation of Natural Capital in Accounting for Sustainability, Barbara Geno (Faculty of Business and Computing, Southern Cross University).

The valuation problems associated with sustainable development have been minimally explored from the perspective of the financial accounting framework and asset valuation. In this paper, the valuation of natural capital is discussed, in the context of the Australian rural sector. The following valuation problems for natural assets were identified:

- calculation of an integration of restoration costs

- valuation problems arising from sustainable harvest of renewable resources
- calculation of value for the use of non-renewable resources
- calculation and integration of biodiversity values

The paper concludes that conventional accounting theory has much to offer in the proposed valuation of natural assets, particularly in the area of restoration and replacement costs and the maintenance of productive capacity. However, the accounting standards will require amendment to allow greater reliance on valuation which is future oriented rather than focussed on the past. The use of present value is shown to be a useful tool, but more problematic in introducing into common use. Improved valuation of natural assets within entity accounts has a greater potential to impact on an entity's actions than some policy measures which have been proposed, such as increased taxes.

Australia: State of the Environment 1996

The 1996 *State of the Environment Report*, an independent report presented in May to the Commonwealth Minister for the Environment by the State of the Environment Advisory Council, has been recently released. It can be purchased from CSIRO Publishing, PO Box 1139, Collingwood, Vic 3066, and copies of the Executive Summary are available from the Community Information Unit of the Department of the Environment, Sport and Territories, telephone 1800 803 772.

This is the first ever independent and comprehensive State of the Environment Report for Australia, and covers land, water, air, plants and animals, human settlements and how we value them. It provides a scientific assessment of environmental conditions, focusing on the impacts of human activities, their significance for the environment and social responses to the identified trends.

The report identifies sustainable development as "arguably the central issue of our time", and one of its functions is to assess progress towards the goal of ecological sustainability. The knowledge base upon which decisions about the environment are made is identified as "currently inadequate", and, as the Report points out:

> "while we believe that more than 90 per cent of vertebrates and higher plants in Australia are identified and described, it is estimated that only about 50 per cent of the invertebrates and simpler plants are identified. We know even less about other species such as fungi and bacteria. With such limited knowledge, it is impossible to assess the impact of human activity on biodiversity - a critical aspect of ecosystem health and resilience".

There is indeed much to do, but in this Report a start has been made. Its key objectives include:

- To provide accurate, timely and accessible information about the condition and prospects of the Australian environment.
- To increase public understanding of these issues.
- To facilitate the development of an agreed set of national environmental indicators, and to review and report on these indicators.
- To provide an early warning of potential problems.
- To report on the effectiveness of policies and programs designed to respond to environmental change, including progress towards achieving environmental standards and targets.

This publication is an excellent resource, and is commended to anyone with an interest in environmental issues in Australia.