

IMPLEMENTING AN ENVIRONMENTAL MANAGEMENT SYSTEM



Paper Presented by :

Audrey Chinn

Author:

Audrey Chinn,
Environmental Engineer,

North East Region Water Authority



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Audrey Chinn, Environmental Engineer, North East Region Water Authority

ABSTRACT

North East Region Water Authority is in the process of establishing and maintaining a best practice Environmental Management System. This paper outlines the framework of NERWA's EMS, discusses the planning, development and implementation stages of the EMS.

KEYWORDS

EMP – Environmental Management Program

EMS – Environmental Management System

NERWA – North East Region Water Authority

Environmental aspect – Environmental aspects are the environmental impacts or risks of environmental impacts caused by activities undertaken. An environmental aspect may result from an activity that may cause an environmental impact (eg: chemical spill, process failure leading to wastes or an accident leading to wastes released to the receiving environment).

Nonconformance – A nonconformance occurs when the environmental performance of the organisation falls outside the specified requirements documented in an organisation's environmental management system as defined by QAS – Implementing an Environmental Management System.

Significant environmental aspect – An environmental aspect that has or can have a significant environmental impact as defined by AS/NZS ISO 14001.

1.0 INTRODUCTION

An Environmental Management System (EMS) is a management system that is based on environmental criteria, standards and performance aimed at continual environmental improvement performance and ecological sustainable development. North East Region Water Authority's EMS is based on the standard requirements set by AS/NZS ISO 14001.

The adoption of a pro-active approach to environment protection is the basis of NERWA's EMS. The change from a reactive action (after the event occurs) to a preventative action (before the event occurs) is the practice adopted for managing NERWA's operations. By implementing preventative measures, we are able to minimise the actual or potential detrimental environmental impacts our operations may have on the environment. Establishing an EMS will also ensure legal compliance within NERWA. The processes of self assessment, self regulation and self management as required by AS/NZS ISO 14001, are also the requirements many statutory and regulatory bodies are trending towards.

The establishment of an EMS in an organisation is a complex task but even more so in NERWA's case due to the nature and scale of our operations. NERWA provides water and sewerage services to 36 townships in North East Victoria, extending from Corryong in the East, along the Murray River to Yarrawonga, south to Benalla and the alpine towns of Bright, Mt Beauty, Dartmouth. We service an estimated population of 91,000 people in an area of approximately 20,000km².

Though the establishment of an EMS proved to be an enormous task, a management system will enable us to manage and control our activities within our region.

NERWA had assistance from the following consultancies in the planning and development stages of the EMS:

- ◆ GHD had developed an EMS for the former Ovens Water (now amalgamated with Kiewa Murray Water forming NERWA). The previous work undertaken by GHD has aided in the planning stages of NERWA's EMS.
- ◆ Infotech Research aided in the planning and development stage,
- ◆ Enviro Risk Management conducted an environmental risk review on chemical and fuel handling,
- ◆ Emergency Management Planning developed a Dangerous Goods Register and conducted staff training for the storage and handling in accordance to the Dangerous Goods Regulations, and
- ◆ QAS is the certifying body for NERWA and will be conducting an environmental awareness training course for all staff in July.

2.0 DISCUSSION

2.1 Planning and Development

The basic framework of our EMS is a risk management tool based on the following:

- ◆ Risk Identification
- ◆ Risk Assessment and
- ◆ Risk Control

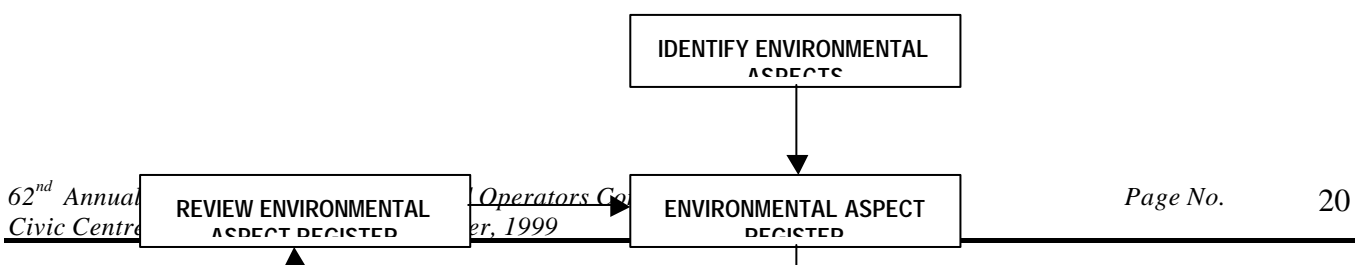
NERWA adopted this risk management principle and altered it accordingly to cater for our specific needs. The functioning of NERWA's EMS as depicted in Figure 1 consists of:

- ◆ *Identification of Environmental Aspects*
This is our risk identification process. The identified environmental aspects are then entered into a register – The Environmental Aspect Register.
- ◆ *Environmental Risk Assessment*
An environmental aspects analysis was necessary to prioritise our aspects as it led to the identification of our significant environmental aspects. This enabled us to set environmental targets and objectives that formed the basis of NERWA's Environmental Management Program.
- ◆ *Development of an Environmental Management Program*
The risks associated with the identified significant environmental aspects is controlled via procedures or included in the Environmental Management Program (EMP). The EMP is reviewed on a six monthly interval. Any aspects whose risk has been controlled via the elimination, substitution and/or reduction process would be marked as complete and removed from the Environmental Aspect Register. The register is also reviewed on a six monthly interval.

New environmental aspects are captured into the system via our environment incident reporting and new project audit checklist procedure. This covers the areas of our organisation (Development & Construction and Operations & Maintenance) that pose the most environmental risk.

The Identification of Aspects, Environment Risk Assessment and Development of Environment Management Program will be discussed in detail in the following sections.

Figure 1: Framework of NERWA's EMS



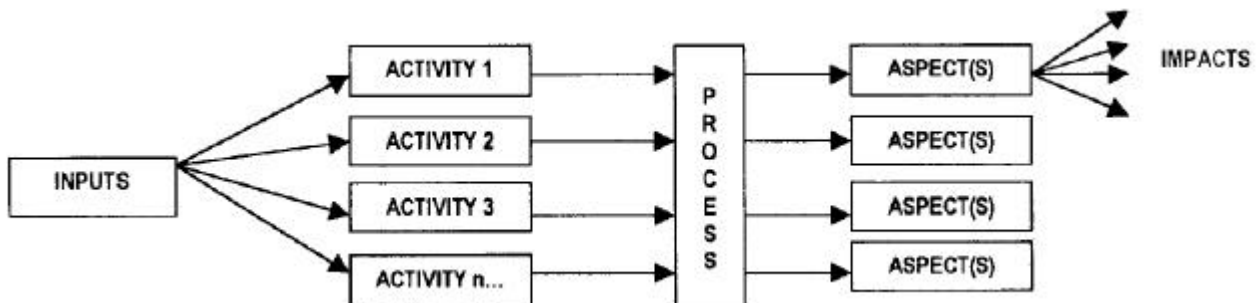
2.2 Identification of Environmental Aspects

The first part of the planning stage was to identify our environmental aspects (which includes our legal requirements). This identification process is integral to the successful development and functioning of the system. It involved the identification of all processes and activities under normal and abnormal operating conditions and emergencies.

The methodology adopted was the flow chart process as shown in Figure 2. It involves the:

- ◆ identification of all activities associated with each process and
- ◆ inclusion of all input streams such as chemicals, power, raw water, et and output (or waste) streams such as sludge, wastewater, etc...for each activity,

Figure 2: *Flowchart process*



There are positive and negative environmental aspects depending on their related environmental impact(s). If an impact is detrimental to the environment, then its associated environmental aspect is a negative aspect whilst if an impact is beneficial to the environment, then its associated environmental aspect is a positive aspect. Environmental aspects are identified using this flow chart process as each output or waste stream is the environmental aspect(s) of its associated activity.

This flowchart process was conducted at all NERWA sites which includes water and wastewater treatment plants, depots, offices, water storages, pump stations, etc. in conjunction with the site operator. This was an extremely time consuming exercise once again due to the number and locality of our main sites. However, this played an essential part towards the planning and development of the system as it provided us with an understanding of what and where our potential environmental impacts are.

An Environmental Aspects Register was compiled from all the identified environmental aspects. The register is in electronic form. It is a database that is located on NERWA's local computer network

and readily accessible to all staff. The register provides detailed information on each site listing:

- ◆ all activities conducted on that site,
- ◆ the environmental aspects relating to an activity and
- ◆ the environmental impacts of that aspect.

Using this environmental aspect identification process, we are now aware of where the “weaknesses” are within our organisation. The next step we took was to conduct an Environmental Risk Assessment to prioritise the environmental aspects. This enabled us to determine which aspects would cause the most environmental impact. The aspect that causes or has the potential to cause the most environmental impact is defined as a significant environmental aspect.

2.3 Environmental Risk Assessment

An Environmental Risk Assessment was needed to prioritise our numerous environmental aspects in order to identify and address the significant environmental aspects. This would aid in developing a manageable system. An Environmental Aspect Analysis workshop, which involved input from management and operations, was held to perform this task.

Each environmental aspect was prioritised based on an assessment matrix. Each aspect was given a ranking from 0 to 5 in each of the four categories: Compliance with Environmental Regulations, Cost of the Environmental Impact, Opportunity/Cost for Improvement and Ease of Improvement. The total score provided a ranking from 0 to 20. This gave us an indication of the “priority” status of an environmental aspect and allowed determination of its significance.

By identifying our significant environmental aspects, we were then able to trace back in the flowchart and determine which activities these aspects resulted from. This led us to an understanding of which of our activities we need to manage and control in order to eliminate/substitute/reduce our environmental risks. NERWA’s significant environmental aspects are managed via procedures (to control activities that have or may have significant environmental aspects) or inclusion in the Environmental Management Program.

2.4 Environmental Management Program

These identified significant environmental aspects were used to establish NERWA’s environmental targets and objectives thereby forming the basis of our Environmental Management Program. The EMP is our broad environmental program that states:

- ◆ NERWA’s targets and objectives to reflect our environmental policy
- ◆ the timeframe for us to achieve these targets and objectives
- ◆ the specific programs we have in place to achieve the set targets and
- ◆ the human and financial resources allocated for the specified program

Incorporated into the EMP are individual programs that are set up to meet environmental targets. Some of the programs include:

- ◆ Environment Improvement Plan - These are programs established to fulfil our commitment for continuous environment improvement.
- ◆ Environment Management Plan – These are site specific management plans as required by the EPA and stated in all new operating licences.

We had decided to make our EMP a public document and in doing so, this enabled us to communicate and inform our customers and stakeholders about our environment management practices. This was a valuable public promotion exercise for NERWA, and at the same time it fulfilled the ISO14001 requirements for communication.

2.5 Implementation

Many of the elements of the EMS are currently existing within NERWA. We have existing monitoring programs, annual environmental reporting, sewer blockages and spills database, blue green algae plan, emergency response plan, etc. are such examples. These were all incorporated into the system.

However, there are still a few elements of the EMS that needs to be set up. One of the major tasks that we are currently facing is the documentation of the actual system and establishing a document control for the system. Currently, we are still in the midst of the implementation stage. To aid us in the implementation stage of the EMS, an Environmental Management Committee was established.

2.6 Environmental Management Committee

An Environmental Management Committee (EMC) was set up to oversee the implementation of the EMS. Members appointed to the committee are from all levels of our organisation: CEO, management, office staff and operators. This is to ensure that inputs from all levels of the organisation are incorporated into the system.

To date, the committee's functions have included:

- ◆ the development of the Environmental Policy (with the guidance of Infotech Research)
- ◆ setting environmental targets and objectives and
- ◆ setting up Improvement Teams

The EMC is also the reviewing body of the system. This ensures that the EMS is an effective and dynamic system which is constantly evolving with our organisation whilst meeting the management review requirements as specified by AS/NZS 14001.

The EMC review of the system includes the assessment of:

- ◆ the environmental policy
- ◆ the organisation's overall environmental performance
- ◆ the results of internal audits
- ◆ progress of the EMP
- ◆ non conformance reports and the
- ◆ corrective action implemented

2.7 Environment Improvement Teams

The EMC had set up four improvement teams where areas for environmental improvement had been identified via the environmental aspect identification process. Each team was given a target. The main task of the teams was to investigate options on how NERWA could best achieve these targets. The teams were then to present their findings and recommendations to the EMC. The four improvement teams were:

Water Team

Improvement in this area has been identified since we are losing 30% of our water and the related revenue/energy/time/chemicals that have been invested in treating the water. The team had identified the areas of water losses leading to the initiation of other projects such as the identification of metered & unmetered services, removal or metering public standpipes, etc... The recommendation proposed by the team for achieving 10% reduction of water losses by June 2000 has been accepted resulting in the creation of a new job position.

Chemical team

Initially, the team's task was to investigate ways to optimise our chemical usage thereby reducing overall chemical consumption. However, our capital works program involved the construction of several new water treatment plants, which would actually increase our overall chemical consumption rather than decreasing it. Therefore, the team's targets could not be met. The team had however identified other areas of improvement. It was discovered that NERWA was purchasing chemicals from several companies and we had limited control over handling and delivery conditions due to the absence of a formal contract. The new objective of the team was the standardisation of chemical procurement. This would have economic benefits for NERWA as well as more control over the delivery and handling of the purchased chemicals by ensuring the successful tenderer fulfils the requirements of our EMS as well as the legal requirements of OH&S, Dangerous Goods, etc...

Fuel Team

The fuel team's task was to investigate ways for NERWA to reduce our fuel consumption by 5%. This is in keeping with a global issue – greenhouse gases and global warming. NERWA's target was aimed at reducing our greenhouse gas emissions in keeping with our commitment to continually improve on our environmental performance. The fuel team shall be presenting their findings and recommendations in July.

Paper Team

The paper team's task was to ensure that 95% of its paper waste is recycled. The team conducted preliminary bin audits discovering that only 40% of paper waste was being recycled. The team then conducted an information session and set up a paper recycling program. Audits conducted after the program showed 96% of paper waste was being recycled. The team had not only achieved their target but also surpassed it.

The improvement teams have proven to be of great benefit to NERWA. Proving that not only does the EMS have environmental benefits but social and economical ones too.

2.8 Training

Training is an essential part of the functioning of the system. Training modules need to relate to activities within the organisation. This enables personnel to be aware of how their work practices may impact on the environment. The training element of our system has not yet been completed. QAS will be conducting an Environmental Awareness Training course for all NERWA staff in July.

NERWA staff was introduced to the EMS via an authority wide EMS Presentation. The purpose of this was to raise the profile of the EMS, raise environmental awareness and an indication of NERWA's commitment to the environment. The presentation was conducted by the:

- ◆ CEO – To ensure all staff was aware of management's commitment to the EMS,
- ◆ EMS Coordinator – This was to introduce the EMS Coordinator so that all staff knows who to go to for environmental issues and
- ◆ Infotech Research.

Other informal training was conducted during the planning and development stages of the EMS such as the environmental aspect identification, environmental aspect analysis, etc... where operational input was essential for the functioning of the system. By working in conjunction with the EMS Coordinator to identify (for example) the environmental risks within their system, the operators had a better understanding of what impacts their activities have or may have on the environment. This also allowed the coordinator and the operators to "brainstorm" their ideas for an improvement.

As part of the EMS training program, when the EMS Procedures Manuals are distributed, a "cooling off" period of two weeks will be given before a training session on the application of the procedures manual is conducted. This will help operators understand the need and relevance of the procedures. For example, our Environmental Incident Reporting Procedure involves the reporting

and documentation of all environmental incidents. The main obstacle will be to convince the operators that all incidents need to be documented. Some of the benefits of documenting and reporting an environmental incident are:

- ◆ identifying deficiencies within the system
- ◆ verification of due diligence (if standard operating procedures were followed)
- ◆ opportunity for personnel to raise outstanding issues (that may not necessarily be environmental) that may have lead to the incident occurring

3.0 CONCLUSION

We are still in the implementation stages of our environmental management system. However, the benefits of having an EMS within an organisation are already evident. Our customers and stakeholders view us as an environmentally conscious water authority. We are also practicing due diligence by ensuring compliance with our legal requirements. The EMS also ensures that all of our activities and operations are conducted using standard environmental practices to minimise our impacts on the surrounding environment.

4.0 REFERENCES

Australian Standards (1996) “AS/NZS ISO 14001 – Environmental management systems – Specification with guidance for use”

Quality Assurance Services (1996) “Implementing an environmental management system”