

ENVIRONMENTAL MANAGEMENT TRAINING – A CIVIL BASED INSTRUMENT TO ENSURE ENVIRONMENTAL PROTECTION AND LEGAL COMPLIANCE: THE MOOIRIVIER MALL CASE STUDY

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ABSTRACT

Currently a large scale infrastructural mall development of 48000 m² is being constructed adjacent to the Mooi River in the central business district of the city of Potchefstroom. This development is facing significant environmental and social challenges due to the highly sensitive environment in which the development is being constructed. In projects like the Mooirivier Mall Development the actions of all employees at all levels, may contribute to the overall degradation of the surrounding biological and social environment if not controlled by proper environmental instruments. Several environmental management instruments are available for managing the aspects contributing to environmental and social degradation. However, environmental awareness raising and education as a an environmental management instrument in the project life-cycle of a large scale infrastructural development should not be underestimated in the protection of the environment. The latter statement is supported by various South African statutory requirements and the applicable environmental authorisations issued and enforced by competent authorities.

Due to the significant environmental, social and financial challenges faced, the Mooirivier Mall development serves as a unique case study for environmental training and education. This paper firstly explores environmental training as a civil based environmental management instrument. Furthermore, the Mooirivier Mall development will be discussed as a case study for legal requirements for environmental training on a project level, as well as the need for an environmental management plan for a development project. The challenges faced and lessons

learned in the implementation of the environmental training plan for the Mooirivier Mall development will also be discussed critically before reaching a conclusion.

Keywords: Environmental training and awareness, Environmental management training plan, Environmental Impact Assessment, Environmental Management Plan, Project Life-cycle, Environmental impacts.

1. INTRODUCTION

After 1992 Earth Summit in Rio de Janeiro, Brazil, a UN Council was established to develop an *Earth Charter* listing the basic principles for environmental protection and environmentally sustainable development. The charter was finalised in March 2000 after many reviewed drafts and after more than 100,000 people in 51 countries and 25 global leaders in environment, business, politics, religion, and education took part in creating this charter (Miller, 2007: 625). Principle 14 of the charter states that we have to “*Integrate into formal education and life-long learning the knowledge, values, and skills needed for a sustainable way of life*”. It continues with the following words in principle 14a: “*Provide all, especially children and youth, with educational opportunities that empower them to contribute actively to sustainable development*” (Earth Charter, 2000). These powerful words emphasise the importance of environmental education. Unfortunately in developing countries such as South Africa, entire generations may never have received any form of formal environmental education. This poses immense challenges to authorities and developers who must comply to and enforce environmental statutory requirements on a project level in that the most basic environmental friendly actions, such as dumping waste in a dust bin must be re-introduced to the work force.

Environmental training is classified as a civil or social based environmental management instrument which aims to influence and direct human behavior in order to protect the environment. It is also a legal requirement in terms of a number of South African statutes to conduct environmental training on a project level. However, it is critical for developers and environmental managers to conduct a training needs analysis in the project planning phase in order to ensure that the training will be

sufficiently rolled-out during construction and operational phases. If this is not done, severe challenges may be faced to conduct proper training and to comply to the legal requirements. The abovementioned will be discussed in more detail in the following sections of the paper.

2. ENVIRONMENTAL TRAINING AS A CIVIL ENVIRONMENTAL MANAGEMENT INSTRUMENT

Environmental instruments are tools to be adopted by any organisation or organ of state for the realisation of specific objectives of predetermined environmental policies. There are four different types of policy instruments namely: regulatory, economic, social and physical. Regulatory instruments consists mainly of rules, regulations, standards, policing and compliance, while economic instruments are typically charges, taxes, tradable permits, and subsidies. Physical instruments are instruments related to technology, infrastructure development and planning. Physical measures create something physical to alter human behaviour. Social instruments are those related to partnership, self-regulation or voluntary initiatives (e.g. environmental auditing and ISO 14001), information related measures (e.g. eco-labelling) and awareness (e.g. publicity and environmental education). These instruments are intended to alter behaviour through some kind of social behaviour (IGES, 2004: 17).

It is important to note that these different instruments are complementary to each other. It is therefore imperative that an environmental manager choose a dynamic “toolbox” for a specific scenario or project as indicated in Figure 1. For example, in some cases, economic instruments could be made effective if accompanied by social instruments and physical instruments cannot be put into practice unless they are properly funded and socially accepted (IGES, 2004: 18).

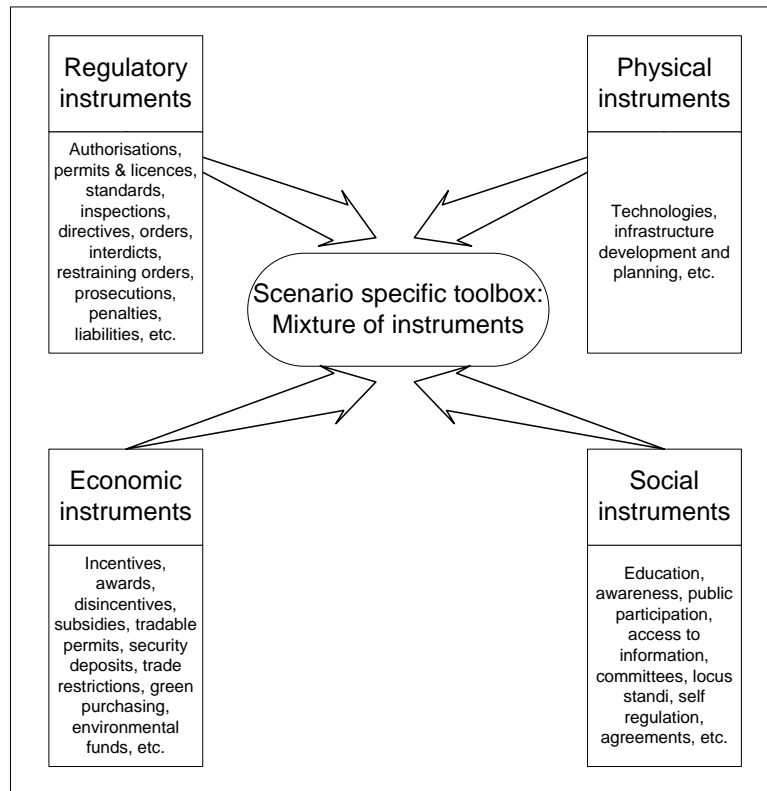


Figure 1: Selecting environmental instruments for a specific scenario

The focus of this paper is on environmental training and awareness raising on a project level, which is part of social environmental instruments. The need for this critical instrument will be discussed in more detail by referring to the Mooirivier Mall development.

3. THE MOOIRIVIER MALL DEVELOPMENT, SITE CHARACTERISTICS AND ASSOCIATED ENVIRONMENTAL IMPACTS

Mooi River Mall (Pty) Ltd proposes to develop a single, enclosed, regional retail mall, offices of approximately 48 000 m². The mall will mainly be a single storey structure with a portion of first floor offices and a basement as well as underground parking. The proposed activity will be located on two properties bounded by the Mooi River Boulevard in the west, Lombard Street in the north and the N12 (Potgieter Street) to the east and the south (Figure 2).



Figure 2: Final Mooirivier Mall design

As seen in Figure 2 the development will stretch across the Mooi River floodplain area between Lombard and Potgieter Street. As neither of the property sites are large enough to accommodate the development, a 60 m wide section of the proposed mall will span over the Mooi River at the northern section of the site, just south of Lombard Street and allow shoppers to cross the river inside the proposed development.

3.1 Environmental challenges of the proposed site

Although the site is characterised by numerous financial and social positives it also poses significant environmental constraints and challenges to the proposed development due to the sensitive environmental location of the site. Firstly, the site is located within the Mooi River open space system. This open space system is referred to as the “Green Belt of Potchefstroom” and forms part of the open space network of

the city, with the river as its central element. The importance of the open space network to the city cannot be overemphasized and should be managed in an integrated manner based on sound ecological principles. However, due to financial constraints this is not always possible and alternative ways, such as the Mooirivier Mall development and its positive financial, social and environmental spin-offs, should be found to protect, rehabilitate and maintain the river system (Holm Jordaan Group, 2006).

Secondly, the site is situated within the 1:50 and 1:100 flood lines. This poses significant planning, design, construction and operational challenges to the developer as well as an increase in the potential flooding risk to the surrounding existing developments. Apart from the potential hydrology and flooding impacts of the development, malls are also associated with other known impacts caused by activities, products and services during the design, construction and operational phases of the mall development (Nel and Wessels, 2006: 43).

It is thus evident from the information supplied in this section of the paper that innovative environmental management and associated environmental training is needed throughout the project life-cycle of the development to ensure the sustainable protection of the Potchefstroom environment.

3.2 The legal requirements for environmental management training for the Mooirivier Mall development

The law stands in service of society; it regulates the relationship between people themselves as well as between people and the environment (Du Plessis, W. 1997). To ensure the latter, the law places a legal duty on developers to consider environmental management during their operations. These duties are scattered in the maize of environmental legislation. However, key South African acts contain environmental elements and duties applicable to developers. The Constitution of the Republic of South Africa Act 108 of 1996, (the Constitution), for example, forms the main framework within which other legislation has to be interpreted, while the National Environmental Management Act 107 of 1998 (NEMA) and the remaining sections of the Environment Conservation Act 73 of 1989 (ECA) may be labelled as

environmental framework legislation. Acts such as National Water Act 36 of 1998 (NWA) is sectoral-specific legislation, specifically written with the aim protecting an element of the environment. The purpose of this section of the paper is to briefly indicate the duties placed on the Moorivier Mall developer by the applicable legislation with regards to environmental training.

3.2.1 The Constitution

Section 24(b) of the Constitution, constitutionalises the notion of intergenerational equity. It also places a positive duty on the juristic and natural person to protect the environment. The abovementioned is to be achieved by legislation and administrative measures aimed at (i) the prevention of pollution and ecological degradation; (ii) the promotion of conservation; (iii) the securing of ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

Measures to combat environmental degradation will benefit people living now as well as future generations. One may, therefore, argue that the constitution places a legal duty on developers to ensure that measures such as environmental management training as provided in 24(b) are taken in to consideration in order to prevent environmental pollution or degradation.

3.2.2 NEMA

NEMA principle 2 (h) stipulates that environmental education and training has an important role in ensuring community well being, and that it is through environmental education and training that knowledge and experience can be shared to enable broad-based empowerment and participation (Makana Municipality, 2005 : 18).

Another principle indirectly supporting integrated environmental management and environmental training is the precautionary principle as reflected in section 2 of NEMA. It may be argued that training and awareness raising of employees are key precautionary measures within a reasonable person approach in ensuring the protection of the environment.

Furthermore, section 23 (b) outlines the objectives of integrated environmental management. These objectives are amongst others to: identify, predict and evaluate the actual and potential impact on the environment, socio-economic conditions and cultural heritage, the risks and consequences and alternatives and options for mitigation of activities, with a view to minimising negative impacts, maximising benefits, and promoting compliance with the principles of environmental management set out in section 2.

The duty of education is, however, ingrained in Section 28 (1) to (2)(b). Section 28(1) specifically states that “a person who causes, has caused, or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing, or, in so far as such harm to the environment is authorised by law or cannot be reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment. Section 28 (2)(b) continuous by stating that “the persons on whom subsection (1) imposes an obligation to take reasonable measures, include an owner of land or premises, a person in control of land or premises or a person who has a right to use the land or premises on which or in which- **must inform and educate employees about the environmental risks of their work and the manner in which their tasks must be performed in order to avoid causing significant pollution or degradation of the environment**”.

It may therefore be concluded that NEMA places a positive, precautionary onus on the developer to protect the environment through training and awareness raising of employees.

3.2.3 Requirements in terms of environmental authorisations

An environmental authorisation may be defined as being a: written order, document or certificate that may be issued by a competent authority (government department, minister, authorised official) to an applicant to grant the applicant permission to perform certain acts or activities that may have an impact on the environment

(Wessels, 2005:19). For the Mooirivier Mall development two separate environmental authorisation in terms of the ECA and the NWA had to be obtained. These authorisations and its conditions relating to training and awareness raising will briefly be discussed in the following sections.

3.2.3.1 The Record of Decision (ROD) in terms of the ECA

At the time of initiating the project the proposed Mooirivier Mall development was identified in terms of section 21 of the Environment Conservation Act 73 of 1989 (ECA) as an activity that may have significant detrimental effects on the environment and, therefore, requires an authorisation from the North-West Department of Agriculture Conservation and Environment (NWDACE), in terms of section 21 of the ECA. The ROD contains eleven standard conditions and twenty-seven specific conditions to which the applicant must comply. The standard condition 6.1.4 states that *“The conditions of this authorisation must be brought to the attention of all persons (employees, sub-contractors, contractors, etc) associated with the undertaking of these activities...”*. This is a clear legal duty to inform all employees of environmental commitments through training and awareness raising.

3.2.3.2 The water use licence (WULA) in terms of the NWA

The building of the mall on the banks of the Mooi River is a listed activity in terms of section 21 of the NWA in that the bed, banks or characteristics of a watercourse will be altered, therefore, the developer requires a licence in terms of this section of the NWA. This licence was obtained from the Department of Water Affairs and Forestry and contains forty-six specific conditions, which the applicant must adhere to. Condition 5.12 states that *“The conditions of the licence must be brought to the attention of all people associated with the undertaking of this activity...”*. Similar to the ROD conditions, the licence places a legal duty on the developer to inform employees through training and awareness raising of the environmental conditions, impacts and constraints.

3.3 The environmental management training plan

As seen in the previous section of the paper, training and awareness raising is a legal duty on developers. Therefore, the importance of training as an environmental management tool in the project life-cycle, should not be underestimated. Ideally the entire workforce should undergo an environmental awareness training course to understand how they may play a role in achieving the objectives specified in the Environmental Management Plan (EMP) (DEAT 2004, Environmental Management Plans, Information Series 12).

It is critical that proper training needs analysis must be conducted in the planning phase of a large scale infrastructural development project in order to determine the specific environmental training needs of all employees to be involved in the project. This vital exercise was not done in the Moorivier Mall case study which lead to various problems being experienced during the roll-out of environmental training during the construction phase of the project (refer to section 5 of the paper).

Before conducting the training needs analysis, information should be available in the form of an organogram or any other form to indicate the key role players associated with environmental management (refer to Figure 3 for the Moorivier Mall institutional arrangements). It will be possible to derive from this information who and on what level environmental management training should be received and who will be responsible for conducting the training. The abovementioned will be discussed in more detail in the following sections of the paper.

3.3.1 Determining the institutional arrangements regarding environmental management during the project

As stated before, a crucial exercise to conduct in determining the needs of environmental management training on a project level, is to map the key role players that plays a key part of the project in all stages of the project life-cycle. An example of the so called “map” may be an organogram, which indicates the organisational structure and the levels of employees within the organisation or project team. Figure

3 indicates the institutional arrangements made for the Moirivier Mall development in order to ensure the successful implementation of environmental arrangements. This diagram may serve as an example to be used in determining who should receive what type of environmental management training.

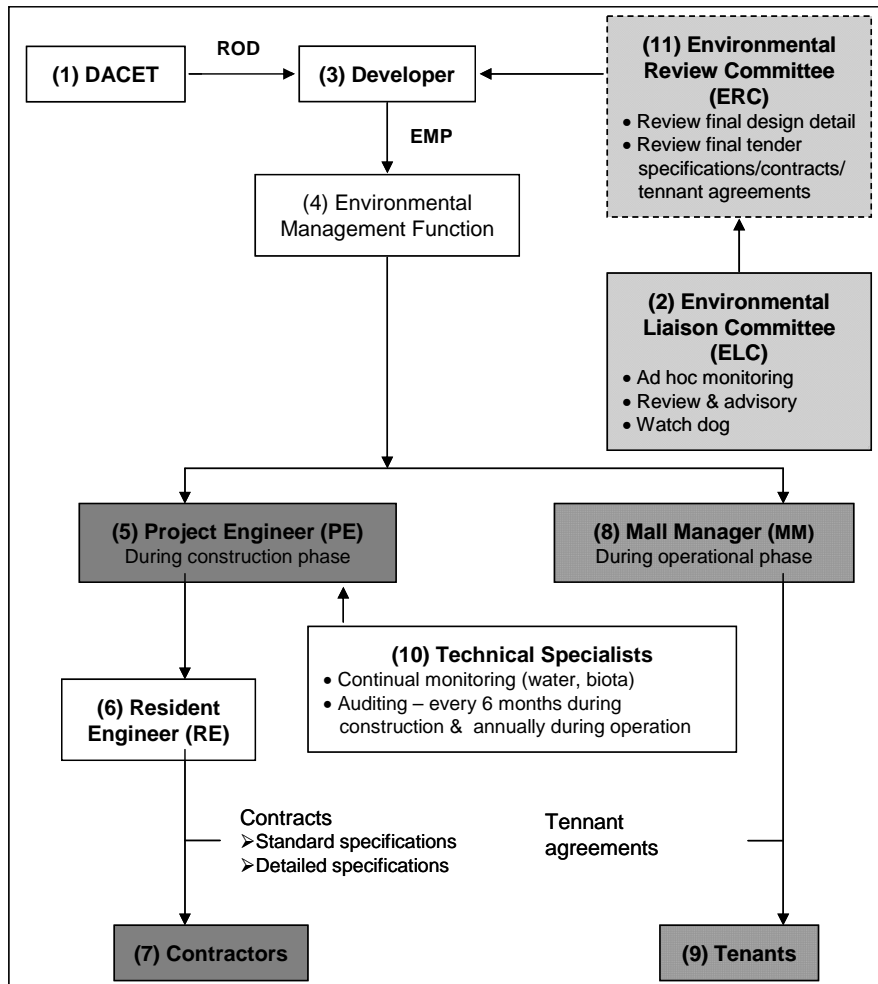


Figure 3: Institutional arrangements of the Moirivier Mall development

3.3.2 Conducting the training needs analysis for environmental management

A training needs analysis is an action by which an organisation identifies the environmental training needed for the organisation. A questionnaire is the most accepted method used to identify the training needs. This questionnaire may be drafted by the environmental specialist in the planning phase of the project and be

provided to the developer and the professional team of the project in order to conduct the survey. Ultimately the answers obtained will help you to draft a training plan.

Table 1: An example of an outcome of a training needs analysis

#	Environmental skills required	Position in project								
		Developer	Environmental officer	Architects	Project engineer	Landscape architect	Mall Manager	Contractors	Tenants	General workers
1	Legal requirements and liabilities: ROD, EMP & WULA	C	C	C	C	C	A	A	A	A
2	Environmental roles and responsibilities	C	A	A	A	A	A	A	A	A
3	Environmental impacts and aspects of the development	A	C	A	A	A	A	A	A	A
4	Mitigation and rehabilitation of impacts	A	C	A	C	C	C	C	A	A
4	Emergency incidents and response	C	C	A	A	A	C	C	C	C
5	Communication of incidents	C	C	A	A	A	C	C	A	A
6	Green building design	A	A	C	A	A	A	A	A	A

Keys:
 C - Competence training
 A - Awareness training

It is important to distinguish between awareness training and competency training as this will influence the approach and level of the training required. Awareness training refers to training that is provided to all employees and on-site contractors irrespective of whether they are associated with significant environmental aspects, whereas competency training refers to training that may be provided to employees that are associated with significant environmental aspects. Such training is indicated when the employee is not considered competent on the basis of previous training, education, or experience, to address the responsibilities he/she has been charged with relative to the significant environmental aspect in question.

After conducting the training needs analysis, one may start with planning and drafting the environmental management training plan needed during the entire project life-cycle. This is discussed in the following section.

3.3.3 Drafting the environmental management training plan

To fulfill the legal requirements of the development and to decrease the legal liabilities of the developer, there is a need for an environmentally educated work force. To achieve this, a proper, well planned environmental training plan is required, which will specify who will need what training, at what time during the development, training methods and material to be used and by whom. The latter is the elements of a typical training plan. Importantly, the training plan should be based on the outcomes of the training needs analysis (refer to Table 1). The table below is an example of a general training plan.

Table 2: Example of a general environmental training plan

#	Position	Environmental training required	When in project life-cycle	What training methods	Training material	By whom
1	Developer	Competence training on legislation, roles and responsibilities, emergency incidents and communication of incidents. Awareness training of impacts and aspects and mitigation.	Planning phase	Discussion	Legal register, EMP, method statements, institutional arrangements	Environmental Assessment Practitioner (EAP).
2	Environmental officer	Competence training on legislation, roles and responsibilities, emergency incidents and communication of incidents. Awareness training on roles and responsibilities.	Planning phase	Lecture, discussion, walk-about.	Legal register, EMP, method statements, institutional arrangements.	Formal tertiary education, Developer or EAP.
3	Architect	Competence training on legal requirements and green building design (energy efficiency and water efficiency).	Design phase	Formal training, lectures.	Legal register, SAEDES Energy Efficiency guidelines, SANS standards.	Formal tertiary education, Environmental Officer.
4	Contractors	Competence training on mitigation of impacts, emergency incidents and response, communication of incidents. Awareness training of legal requirements, roles and responsibilities as well as impacts and aspects.	Construction phase	Formal training, lectures using visual aids.	EMP, authorisation conditions.	Environmental officer.

In the Potchefstroom Moirivier Mall case study, the developer and top management were made aware of the critical importance of the sustainable design of the mall in the highly sensitive environment in the project identification and inception phase and it led to more financial commitments made by the developer in the design and planning

phases of the mall. This ultimately resulted in the consideration of the development for approval by the competent authority (NWDACE). Commitment from management may lead to inadequate resources being allocated to the design, construction, operation and termination phases of the life-cycle, which may ultimately lead to failure of obtaining a license to develop and operate (Nel & Wessels, 2006).

A standard condition of environmental authorisations is the appointment of an environmental control officer (ECO), which have the task of ensuring compliance to the authorisation and the conditions of the authorisation. The environmental control officer is also tasked to liaise and communicate all environmental issues and non-compliance to and between the authorities, developer and public. The ECO should also be briefed by the developer on the critical issues identified during the Environmental Impact Assessment (EIA) and be given access to all information regarding the development.

Environmental impacts occur at all stages of a products's or projects's life-cycle . However, no matter where in the product or project life-cycle the impact lies, most impacts are 'locked' into the design stage when materials and strategies are selected (Lewis and Gertsakis, 2001: 13). Therefore, bringing the architect on board with environmental design principles and strategies is vital in ensuring sound environmental options during the entire life-cycle of a development project, especially in a sensitive environment such as the Mooirivier case study. Many design parameters such as maximising energy efficiency and water efficiencies, choosing low-impact materials, avoidance of hazardous material, choosing of cleaner production processes and design for waste minimisation may be incorporated by an educated and informed "environmental friendly" architect.

Another critical role of training is the induction training of contractors. The adequate training and control of contractors will ensure the protection of the environment in the construction phase of the project. Because of the highly sensitive environment of the proposed mall, contractors must be given ample training to highlight their activities and products which may cause environmental degradation. The contractors should also be trained in responding to these impacts before they enter the development site to conduct their daily activities.

In the Mooirivier Mall case study it was agreed by the developer that a specific environmental function will be assigned to deal with the construction and operational phases of the project respectively. The project engineer will be responsible for the environmental function during construction and the mall manager will be responsible for the environmental function during the operational phase of the mall. The environmental function during the construction phase was later assigned to the ECO. These assigned responsible persons should receive appropriate environmental management competence training to ensure that the function is conducted responsibly (Nel & Wessels, 2006).

3.4 Challenges faced and lessons learned from the Mooirivier Mall development

Many challenges were and are being faced by the ECO to comply to the legal requirement of training all employees on site on environmental conditions. However, in these challenging times many lessons have also been learned. These challenges and lessons learned are shared and discussed in the following sections.

3.4.1 Challenges faced

The main challenges faced during the construction phase of the project include:

- The lack of a formal training plan;
- The different training requirements for different level of employees such as the professional team and the general workers. This meant that different training packages had to be drafted for the different levels of employees;
- The lack of commitment to training by contractor's managers;
- The work force has never been challenged with such hoarse environmental restrictions and requirements. Contractors, therefore, underestimated the value of the training in the beginning of the project;
- A language barrier was experienced during the training as many of the general workers of the building contractor were from neighbouring countries;
- General workers struggled with the basic science theories and principles, which formed part of the conditions of the environmental authorisations.

- The lack of follow-up training;
- The effectiveness of a one hour awareness training session is questionable as a large number of environmental conditions had to be discussed in a very short period.

3.4.2 Lessons learned

The first obvious lesson learned is to have a formal training plan in place before construction commences. The training needs analysis and the organogram should precede and support the training plan. Secondly, a very critical lesson learned in the Mooirivier Mall development is the awareness raising of the developer and/or top management of a large scale infrastructural development in the project identification and inception phase. This will most probably prevent unnecessary damage to the environment before it has happened. This strongly support the precautionary principle as discussed in section 3.2.2 of the paper.

The diversity of trainers should also not be underestimated as language poses a significant challenge. The ideal should be to have trainers, which are able to speak a variety of languages. Furthermore, the training methods used for training general workers must be as visual as possible in order to explain difficult environmental management principles and legal requirements in a very basic way.

Finally the most important lesson learned in terms of training, is for an environmental control officer to be bold, patient and sympathetic to all employees during the training. Training on a project level is a process not an event. There are numerous other lessons learned during the project with regards to training, which will not be discussed in this paper.

4. CONCLUSION

The importance of environmental education, training and awareness raising is highlighted in the *Earth Charter* and will play an increasingly important role in the

future in all large scale development projects in South Africa. South African legislation supports this notion and places legal duties on all developers to train and educate their work force in terms of environmental management. It is the duty of the environmental specialist or practitioner, however, to inform the developer of these requirements and to aid the developer in the development and implementation of a well prepared training programme. As seen in the Mooirivier Mall case study, significant challenges were faced in the implementation of the environmental training plan. However, challenges produce valuable lessons to be learned by all environmental managers, practitioners and professionals in order to implement environmental training as a civil based instrument in the toolbox of environmental tools.

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