1 Introduction

This article explores how ‘alternative’ environmental enforcement tools may be used to complement and support classical command and control tools in order to improve the overall environmental enforcement effort.

The objective is not to list and discuss any of the alternative enforcement tools available and used in South Africa as this information is readily available in the literature. The debate has shifted from what may be available to an inquiry into the demonstrated enforcement performance and effectiveness of these tools in an attempt to answer the ‘do they work and deliver’ question. A second focus is to understand the framework conditions required to ensure performance and effectiveness to answer the question ‘why does what work?’ A third issue that dominates the debate focuses on the policy challenges of environmental authorities across the world on how to deal with two issues: 1) what should the official policy be on the adoption and use of alternative enforcement tools; and 2) what are the most effective arrangements to ensure that such adopted tools do indeed contribute effectively and efficiently to the overall environmental enforcement effort.

* Professor at and Executive Manager of the Centre for Environmental Management, North West University.
** B Sc (NWU), M Environmental Management and Analysis (NWU). Centre for Environmental Management, North West University
1 See amongst others Hanks 1998 SAJELP 298-354; Hanks Negotiated Environmental Agreements; Fischer Environmental Management Co-operative Agreements; Croci Environmental Voluntary Agreements; ELNI Environmental Agreements and; Ten Brink Voluntary Environmental Agreements.
In an attempt to stimulate debate on the fundamental questions posed regarding the adoption and use of alternative enforcement tools, four sub-themes and a case study are explored in this article. To set the scene a very generic typology of ‘new’ or alternative enforcement tool categories is offered. Secondly, the generally argued benefits and disadvantages of both command and control approaches and alternative enforcement tools are listed. Thirdly, framework conditions for the successful adoption and use of some of the enforcement tools are offered. Empirical and other evidence is then, fourthly, explored to answer the question whether one of the most celebrated voluntary enforcement tools, environmental management systems, rise to the occasion to drive sustained and consistent legal compliance and hence, environmental enforcement. A South African case study is then fifthly presented to illustrate how a combination of alternative enforcement tools has been successfully integrated with command and control tools to ensure consistent and sustained legal compliance once environmental authorisations have been issued.

2 A possible typology of voluntary and or alternative enforcement tools

The number and diversity of ‘alternative’ or ‘new’ environmental enforcement tools designed to overcome the challenges posed by an over reliance on the classical command and control enforcement tools, have grown with leaps and bounds in developed countries since the 1980s. Later on, some developing countries also started to experiment with alternative enforcement tools as is evident in a range of Framework Environmental Legislation.2

Gunningham3 argues that two distinct environmental enforcement phases may be identified in developed countries. The first, a command and control phase commenced in the early 1970s with a proliferation of environmental legislation, performance standards and other command and control instruments.

2 Nel and Du Plessis 2001 SAJELP 1-38.
3 Gunningham and Grabowsky Smart Regulation 7-12.
By the 1980s the inability of command and control tools to consistently and universally change behaviour, spawned a counter movement arguing for large scale deregulation in favour of market based enforcement tools. Once again other, second generation environmental enforcement tools were developed and experimented with as it became apparent that the market also failed to be the panacea for all the environmental enforcement challenges.

Creating a typology of alternative compliance tools is almost impossible as the portfolio of available alternative environmental enforcement tools is complex, interlinked, hybridised and ever changing. All attempts to classify such a diverse portfolio of alternative enforcement tools into a coherent model with exclusive categories, will by necessity be *ad hoc* and arbitrary.4

Environmental enforcement tools are classified for the purpose of this article into the following broad categories:5 classical command and control based instruments6, and three loosely defined categories of alternative enforcement tools: market based instruments,7 civil based instruments8 and agreement or commitment based instruments.9 The latter two may range from entirely voluntary commitments such as the adoption and use of voluntary tools like ISO 14001 based environmental management systems, to voluntary agreements that may also have enforceable elements, that is, enforceable agreements and commitments such as environmental cooperation agreements (EMCAs)

---

4 Gunningham and Grabowsky (n 3) 38.
5 The objective of this article is to explore the performance potential as well as the conditions required for performance of alternative enforcement tools. The objective is not to discuss the characteristics of the four enforcement tool categories, neither is the objective to list all the types or permutations of alternative enforcement tools available per category. See Nel and Du Plessis (n 2) 1-38 for lists of tools per enforcement category.
6 Command and control based tools should cover the entire legal enforcement loop, ranging from policy to legislation, pollution or environmental degradation standards, the full range of command and control instruments, as well as the political will and institutional capacity to drive enforcement and prosecution.
7 Fiscal or economic tools use market based incentive directed, or disincentive directed measures to direct desired behaviour.
8 Civil based instruments include all measures to empower, inform, educate and co-opt civil society to be involved with the enforcement process.
9 Nel and Le Roux “Municipalities as the regulator and regulated”. See also Nel and Du Plessis (n 2).
provided for in terms of Chapter 8 of the *National Environmental Management Act* 107 of 1998. An enforceable commitment is another voluntary enforcement tool, where the regulated entity internalises the enforcement processes that were traditionally the domain of the regulator.

These voluntary enforcement tools may either be directed by very broad based strategic principles that drive behaviour such as the Global Compact\textsuperscript{10} and the CERES Principles\textsuperscript{11} amongst others, or the adoption and use of generic requirements that are widely recognised.\textsuperscript{12} Often voluntary enforcement tools are not based on any guideline or requirement as the regulated are free to design all the solutions and level of performance themselves, environmental management plans (EMPs) that are not verified is a point in case.

Adherence to these tools may also be entirely voluntary, that is, performance is never verified by anybody, while others may need to be regularly verified by independent and competent third party bodies. These verifiers may also again be either entirely independent such as accredited certification bodies providing assurance of conformity, or even enforcement agencies themselves, public watchdog bodies\textsuperscript{13} or even enforcement surrogates\textsuperscript{14} appointed by the regulated.

\textsuperscript{10} UN Global Compact 2008 [www.unglobalcompact.org/](http://www.unglobalcompact.org/) DC2-612. Launched in 2000, the UN Global Compact is a policy and a practical framework for companies that are committed to sustainability and responsible business practices. As a leaderships initiative endorsed by chief executives, Global Compact seeks to align business operations and strategies around the world with ten Universally accepted principles in the areas of labour, human rights, environment and anti-corruption.

\textsuperscript{11} Ceres 2007 [www.ceres.org/](http://www.ceres.org/) Founded in 1989, Ceres is a national network of investors, environmental organisation and other public interest groups working with companies and investors to address sustainability challenges. Ceres introduced the vision of integrating sustainability into capital markets for the health of the planet and its people and achieved remarkable results the past two decades such as the launch of the Global Reporting Initiative (GRI) and the Ceres Principles; a ten-point code of corporate environmental conduct to be publicly endorsed by companies as an environmental mission statement or ethic.

\textsuperscript{12} Such as ISO 14001 based requirements for environmental management systems.

\textsuperscript{13} Watchdog bodies may be community based or non-governmental based organisations, or they may be statutory appointed civil based watchdog bodies such as environmental liaison bodies.

\textsuperscript{14} Environmental enforcement surrogates may amongst others include: environmental liaison officers (ELOs) or environmental control officers (ECOs).
Agreement and commitment based enforcement measures may also range from commitments by a single organisational unit through commitments made by, or on behalf of business sectoral groups.

In reality any of the tools loosely classified into any category may have characteristics of any one or any combination of any of the other categories as well, as alternative tools are increasingly hybridised. The adoption and use of many agreement and civil based environmental enforcement tools are also routinely specified as conditions of environmental authorisations. The fact that some of these agreement and civil based tools are indeed specified as conditions of command and control based tools do not make them less ‘agreement’ or ‘civil’ based.

In South Africa, the legal mandate to adopt and use alternative environmental enforcement tools is alluded to by Du Plessis and Nel, while many of these hybridised alternative enforcement tools are increasingly being provided for in terms of permit or license conditions. Command and control instruments such as authorisations increasingly adopt and use agreement and commitment based enforcements instruments or techniques to drive and direct the environmental enforcement effort.

3 Advantages and disadvantages of command and control and alternative enforcement tools

A fundamental characteristic of all the environmental enforcement categories and tools is that no one enforcement category or tool offers a one size-fits–it-all

15 A typical example of a voluntary commitment made by a single operating unit is the adoption and use of a voluntary enforcement tool such as a formalised environmental management system (EMS) based on ISO 14001 and the informal adoption of an environmental management plan (EMP). Environmental management systems may also be certified by an accredited body, or it may be second party recognised or self declared, without any second or third party verification.

16 Typical sectoral responses include amongst others: the Chemical sector’s Responsible Care, The Forestry sector’s FSC and the banking sector’s Equator Principles.

17 Du Plessis and Nel “Driving compliance”.

5/33
solution to enforcement challenges. Every tool or category of tools has particular strengths and weaknesses characterised by very specific elements where enforcement performance is better than others. See Table 1 for a generic list of the strengths and weaknesses of the command and control category tools and Table 2 for the strengths and weaknesses of some categories of alternative enforcement tools. As argued in the introduction to this article, the debate on alternative environmental enforcement tools tends to focus more on finding empirical evidence to answer the question whether these tools do indeed contribute to the environmental enforcement effort. Reference is made later in this article to the research findings of important studies that aim to empirically establish whether alternative enforcement tools indeed contribute effectively to the environmental enforcement effort.

Table 1: Strengths and weaknesses of command and control tools

<table>
<thead>
<tr>
<th>Weaknesses</th>
<th>Strengths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not effective to deliver policy choices</td>
<td>Dependability</td>
</tr>
<tr>
<td>Not efficient to deliver that at lowest cost</td>
<td>Clarity</td>
</tr>
<tr>
<td>Enforcement is not easy</td>
<td>Major driver for private sector compliance</td>
</tr>
<tr>
<td>Too information intensive</td>
<td>Compliance or non-compliance are readily detectable</td>
</tr>
<tr>
<td>Universal rules do not work</td>
<td>Works well for:</td>
</tr>
<tr>
<td>Absence of incentives</td>
<td>Single media issues</td>
</tr>
<tr>
<td>Often adversarial legal combat results</td>
<td>Control of point source emissions</td>
</tr>
<tr>
<td>May result in administrative complexities</td>
<td>Waste management</td>
</tr>
<tr>
<td>Proliferation of law</td>
<td>Protection of endangered species</td>
</tr>
<tr>
<td>Not flexible enough to deal with dynamic situations</td>
<td>Do stimulate new technologies</td>
</tr>
<tr>
<td>Often media specific</td>
<td></td>
</tr>
<tr>
<td>Difficult to deal with trans-media impacts</td>
<td></td>
</tr>
<tr>
<td>Difficult to deal with regional and global challenges</td>
<td></td>
</tr>
<tr>
<td>Difficult to perform across all the cycle phases</td>
<td></td>
</tr>
</tbody>
</table>
### Table 2: Strengths and weaknesses of alternative tools

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improved flexibility</td>
<td>General mistrust of performance potential</td>
</tr>
<tr>
<td>Improved efficiency, fit for purpose</td>
<td>Not clearly understood</td>
</tr>
<tr>
<td>Enhances innovation</td>
<td></td>
</tr>
<tr>
<td>More cost effective to the government</td>
<td></td>
</tr>
</tbody>
</table>

### 4 Framework conditions to direct the selection and use of alternative enforcement tools

An important question that needs to be asked and answered is: How should the different environmental enforcement tools be structured and used to ensure both sustained and reliable environmental enforcement? In order to answer this question, a number of important insights may guide users when environmental enforcement tools or portfolios of enforcement tools are selected, adopted and used to drive enforcement of environmental law.

The very first insight is that no one tool or category of enforcement tools offer a one stop solution to environmental enforcement challenges. The learning point is that to ensure an effective and efficient environmental enforcement regime, a series of tools need to be selected, adopted and used in order to harness the synergies offered by both their differential performance and failure potentialities. The differential performance and failure argument is supported by the redundancy hypothesis posted by Taylor.18 Taylor19 argued that where two or more elements or subsystems function independently from one another to

---

18 Taylor *Making bureaucracies think.*
19 Taylor (n 18).
achieve the same or similar objective, duplication and overlap significantly reduce the probability that both systems would fail at the same time and in the same area. Should one of the subsystems fail, the other may succeed.

The second insight is that there is no universal cocktail or broad spectrum portfolio of tools that guarantee successful environmental enforcement for all situations. Selection, adoption and use of the correct or optimum mix of enforcement tools that suit specific conditions and requirements, is essential to ensure an efficient and effective enforcement regime. Knowledge of the potential performance and failure modes as well as the strengths and weaknesses of all the types of environmental enforcement tools is imperative to design an efficient and effective portfolio of environmental enforcement tools that offer an improved capability to drive sustained and reliable environmental enforcement.

A third insight is that the efficient and effective deployment of mixed portfolios of enforcement tools is also dependent on both the number and independence of role players involved. A relatively valid generalisation is that the greater the number of role players involved and the greater the independence amongst them, the better is the performance potential of the environmental enforcement effort. Taylor\(^20\) also postulated that the insider-outsider hypothesis explains the dynamics that ensure successful interaction by stakeholder groups with different interests. Two important stakeholders that may be successfully engaged in the enforcement process are government officials and civil society that may co-operate in a mutually beneficial way. Government insiders may have, or lack the political will and mandate to act, but they may have or lack information or resources to do so, while civil society groups may or may not have a mandate to act, but they may have the information or resources and the willingness to act. A strengthened relationship between various interest groups is a powerful mechanism to drive compliance by addressing the weaknesses inherent in single or disjointed interests. The environmental enforcement effort

\(^{20}\) Taylor (n 18).
may also be enhanced where more than one enforcement agency is involved, despite the inefficiencies of duplication and overlap.

The fourth insight is that cognisance should be taken of complex process sequences when enforcement tools are selected adopted and used. Three process sequences offer significant challenges to effective and sustained enforcement processes: the project cycle\(^{21}\) (see Figure 1 after Johan Nel and Louis Kotze),\(^{22}\) the product cycle\(^{23}\) and the plan, do check and acting management cycles.

![Figure 1: The project life cycle and multiple tools](image)

Environmental enforcement through complex chains of project and product phases demand the selection, adoption and use of very specific portfolios of

---

21 Nel and Kotze “Environmental Management”.
22 Nel and Kotze (n 21).
23 The product cycle normally includes: raw material sourcing, transportation, primary, secondary and other manufacturing processes, packaging, storage, procurement, use and integrated waste management.
environmental enforcement tools that are able to perform under specific circumstances. There is just not one single environmental enforcement tool available, including command and control tools that are both versatile and robust enough to ensure sustained environmental enforcement.

A fifth insight is that enforcement tools should be selected to cover the plan, do, check and act (PDCA) phases of the Deming Management Cycle\(^\text{24}\) as no one tool performs equally across the entire PDCA management cycle. To enhance the classical PDCA model, two elements are added: criteria and standards as well as reporting and communication tools (See Table 3 after Willemien du Plessis and Johan Nel).\(^\text{25}\)

**Table 3: The PDCA cycle and environmental governing tools**

<table>
<thead>
<tr>
<th>Analytical and planning tools</th>
<th>Criteria and standards</th>
<th>Management or doing tools</th>
<th>Checking and acting tools</th>
<th>Report and communication tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Social Sustainability and Cultural Impact Assessment</td>
<td>Legislation and national standards, ie, SANS(^\text{26}) standards and guidelines and BAT standards(^\text{27})</td>
<td>Environmental Management Systems</td>
<td>Environmental and Social Monitoring and Measuring</td>
<td>Environmental and Social Reporting Triple Bottom Line Reporting</td>
</tr>
<tr>
<td>Strategic Environmental Assessment</td>
<td>ISO 14001(^\text{28}) standard and other guidelines</td>
<td>Emergency Plans</td>
<td>Inspection, Analysis and Records</td>
<td>Environmental and Social Communication</td>
</tr>
<tr>
<td>Risk Assessment</td>
<td>SA 8000(^\text{29})</td>
<td>Administrative tools, ie, standard operating procedures</td>
<td>Environmental and Social Auditing</td>
<td>Statutory Reporting</td>
</tr>
<tr>
<td>Life Cycle</td>
<td>AA 1000(^\text{30})</td>
<td>Environmental Management</td>
<td>Improvement</td>
<td>Public</td>
</tr>
</tbody>
</table>

---

24 Du Plessis and Nel (n 17).
25 Nel and Du Plessis (n 2).
26 A good example is the SANS air quality standard SANS 1929:2005 Ambient air quality – Limits for common pollutants.
27 Best available technique standards, at the time of writing this article, BAT standards for various sectors are being developed for identified sectors in terms of the National Environmental Management: Air Quality Act 29 of 2004.
28 ISO 14001 2004 [www.iso.org/iso/](http://www.iso.org/iso/)
The sixth insight is that a combination of enforcement tools selected from the four generic groups of tools, that is, command and control tools, market based tools, agreement or commitment based tools as well as civil based tools offer improved environmental enforcement capability when compared to the adoption and use of single, stand alone, environmental enforcement tools.33

The seventh insight is that the South African environmental governing and hence enforcement dispensation is fragmented horizontally between the three spheres of government and vertically amongst the environmental medium specific line functions operating within the three spheres of government.34 The enforcement effort is therefore also fragmented mostly along environmental media lines, while significant duplication and overlap of both the governing and enforcement efforts is common place. It is argued elsewhere in this article that duplication and overlap of enforcement mandates may in some instances indeed be desirable from a sustained enforcement delivery perspective. The concern is a fragmented landscape of environmental enforcement where enforcement has been stepped up by some agencies, while others do either nothing or pay lip service to their mandates to enforce the legislation that they have jurisdiction over. The efficient and effective environmental enforcement

<table>
<thead>
<tr>
<th>Analytical and planning tools</th>
<th>Criteria and standards</th>
<th>Management or doing tools</th>
<th>Checking and acting tools</th>
<th>Report and communication tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessment</td>
<td>Accountability Plan</td>
<td>Management</td>
<td>EMP performance monitoring</td>
<td>participation</td>
</tr>
<tr>
<td>Disaster Planning</td>
<td>Sectoral performance standards</td>
<td>Disaster Management Plan</td>
<td>EMP performance monitoring</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Triple Bottom Line GRI requirements</td>
<td>Continual improvement tools</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

31 Environmental Management Plan.
32 Global Reporting Initiative 2007 [www.globalreporting.org](http://www.globalreporting.org/)
33 See Gunningham and Grabowsky (n 3).
34 Nel and Du Plessis 2004 SAPL 181-190. See also Kotze et al 2007 SAJELP 57-81 and Kotze Legal Framework.
landscape in South Africa is therefore biased to specific mandates, environmental media and even business sectors.

The eighth insight which has transpired over time is that command and control tools remain the principal driver of compliance by organisations. It is therefore imperative that all portfolios of compliance based tools should be based on a sound command and control regime. Alternative enforcement tools used as stand-alone instruments in the absence of a sound command and control base generally fail to deliver on enforcement and compliance expectations. It is at the time of writing of this article also too early to convincingly demonstrate that recent experiments with incentive based trade-off programmes between command and control tools and more voluntary based tools, do indeed deliver more efficient and effective environmental enforcement.

The performance of the much celebrated voluntary enforcement tool, independently certified environmental management systems based on the ISO 14001 standard, is explored in the following section to illustrate the concerns associated with an over reliance on a single instrument to drive environmental compliance.

5 Performance of environmental management systems as a voluntary enforcement tool

The case of environmental management systems (EMS) is used to explore its ability as a largely stand-alone, voluntary based environmental enforcement tool which may consistently and reliably deliver legal compliance on a

35 Du Plessis and Nel (n 17). See references to some trade-off based initiatives. The general concept is that regulated entities are offered relaxations and or waivers of command and control requirements should they adopt and sustainably conform to agree upon requirements.

36 Other voluntary based enforcement tools used in South Africa include amongst others the chemical industry’s Responsible Care Programme, the forestry sector’s Forestry Certification Scheme (FSC) and the banking sector’s Equator Principles. Based on research in Australia and the USA, Gunningham and Grabowsky (n 3) concluded that like other stand alone voluntary tools, Responsible Care should not be used as a ‘stand alone’ compliance tool.
sustainable basis. World wide two programmes for environmental management systems (EMS) exist, the first is the ISO 14001:2004\(^{37}\) based EMS standard of the International Organisation for Standardisation (ISO) and the second the European Union’s Eco-Management and Audit Scheme (EMAS).\(^{38}\) The former is a globally adopted standard, while the latter is limited to the European Union where organisations have a choice between ISO 14001 based and EMAS based EMSs.

It is important to note that the ISO 14001:2004 based EMS standard certifies organisations and not sites or parts of organisations that do not have their own functions and administrations.\(^{39}\) ISO 14001:2004 however does not explicitly require demonstrated legal compliance as a prerequisite for certification. ISO 14001:2004 requires top management to make a public commitment to at least comply with legal requirements. The general interpretation of this requirement is that the organisation’s top management commits itself to legal compliance and as an enforced ‘own commitment’ to compliance, verification of compliance should arguably be part of any internal and external audit programme. Failure to ensure and demonstrate compliance to applicable legal requirements therefore constitutes a significant system failure.

The standard also requires that the organisation shall identify and provide all staff with access to applicable environmental law. The standard tasks the organisation to determine how these applicable legal requirements apply to its operations, that is, the organisation must establish and document what the applicable legal requirements are and what the implications of these are on its operations. These explicit requirements regarding environmental law are followed by a much weaker requirement that the organisation shall only

\(^{37}\) The first revision of the international consensus standard was published in 1996, the second revision in 2004, while a third revision is expected between 2008 and 2012.

\(^{38}\) EMAS 2007 [www.emas.org.uk/](http://www.emas.org.uk/)

\(^{39}\) The general implication is that organisations seeking certification to ISO 14001:2004 may not leave legally non-compliant facilities or actions such as an unlicensed waste site or water treatment works outside the scope of its EMS.
consider these legal requirements when establishing its objectives, targets, and the management plan in particular and the EMS in general. The general interpretation of these requirements is that the organisation shall make voluntary arrangements that may be tempered by financial, operational and or business requirements, to become compliant where non-compliance is evident and to voluntarily maintain a state of self enforced compliance by means of management system requirements such as objectives, targets and management plans. Implementation of these legal compliance commitments is to be achieved by means of operational control arrangements where legal requirements should be used to define operational criteria for specific operations.

Consistent conformity to these arrangements is to be verified by means of a plethora of ISO 14001:2004 checking based arrangements such as monitoring and measurement, and verification of compliance to applicable legal requirements, non-conformity and corrective and preventive action as well as internal and external, third party audits.

These inherent weaknesses of ISO 14001:2004 based management systems are exacerbated by the fact that organisations are not forced to publicly report their state of legal compliance, while a generally accepted perspective is that certification auditors only need to verify whether an organisation conforms to the procedural requirements of the standards and not the actual state of legal compliance per se. At the time of writing this article the actual competence of EMS auditors to be able to confirm that all the procedural legal requirements are satisfactorily planned, implemented, maintained and verified by the auditees is a hotly debated concern.

Evidence from around the globe seems to suggest that confidence is waning in the ability of voluntary based environmental management systems in general.

---

40 Use of the word ‘consider’ in standards generally indicates some degree of discretion available to an organisation, the duty to ‘consider’ does not imply that the organisation shall demonstrate anything in addition to the duty to consider.
and ISO 14001:2004 based EMSs particularly to consistently drive and ensure legal compliance.

Evidence from various research papers at the time of writing this article seems to suggest that the jury is still out on the ability of an EMS to deliver legal compliance and hence to effectively serve as a reliable voluntary enforcement tool. Case research on the effectiveness of EMS is mixed with some researchers reporting successes, while others report failures.

Two international reports and one local communication in the media have shaken confidence in the ability of environmental management systems to deliver, and third party, certification audits to provide assurance of legal compliance. The ENDS Reports\textsuperscript{41} of 2003 and 2006 reported significant dissatisfaction in the United Kingdom with the performance of both environmental management systems and EMS auditors to deliver on the initial promises and expectations regarding the potential of an EMS to reliably deliver sustained legal compliance. The following research findings based on the perceptions of 600 environmental professionals from various sectors were made in the 2006 survey:

- Respondents do believe that EMSs generally contribute to improvements in environmental performance that would otherwise not have been achieved.
- Regarding the impact of EMSs on legal compliance:
  - Three quarters of the respondents felt that an EMS increases the frequency and scope of checks that organisations make to check legal compliance;
  - Almost all respondents believed that EMSs improve understanding of an organisation’s legal status;

\textsuperscript{41} ENDS Report 382 2007 [www.endsreport.com\textsuperscript{30-33}] and ENDS Report 332 2007 [www.endsreport.com\textsuperscript{3-4}].
Only one third of the respondents believed that corrective action\textsuperscript{42} routinely follows detected legal non-compliances;

Only a quarter of respondents reported that certification bodies requested documented evidence that demonstrates that organisations reviewed compliance to all applicable legal requirements when the EMS was initiated;

Only a quarter of respondents reported that certification bodies confirmed that organisations regularly and fully reassess their compliance status as is required by ISO 14001:2004;

Only a third of the respondents reported that certification bodies did indeed confirm on-site evidence of legal compliance, this response is lower than in 2003, when half of the respondents confirmed on-site evaluation of legal compliance.

Fifty-nine per cent of the respondents reported that confidence in UKAS-accredited\textsuperscript{43} certification to ISO 14001:2004 and EMAS has not improved since the initial ENDS survey conducted in 2003.

The lessons learned from the two UK based, ENDS surveys in 2003 and 2006 indicate that both ISO 14001:2004 and EMAS failed to convincingly drive and ensure sustained legal compliance on a voluntary basis.

In order to empirically research the impact of an EMS to improve both environmental performance and legal compliance of organisations, an ambitious three year European REMAS\textsuperscript{44} study was launched in 2003 to statistically quantify the link between EMS as a voluntary compliance tool with improved environmental performance and hence legal compliance. The following research findings have been made:

\begin{itemize}
\item Failure to institute corrective action once a non-compliance has been identified is deemed to be a significant system failure.
\item UKAS 2009 www.ukas.com/
\item REMAS is an ambitious study launched in 2003 in Europe to investigate the relationship between EMS and environmental management performance and legal compliance. See REMAS 2009 remas.iema.net/
\end{itemize}
• Organisations with progressively robust EMSs demonstrate better site based environmental management,
• Those organisations with a nationally accredited EMS certificate demonstrate better site based environmental management than those whose certificates are not accredited;
• Those organisations certified to EMAS demonstrate better site based environmental management than those certified to ISO 14001:2004, as EMAS has stricter requirements regarding legal compliance when compared with ISO 14001:2004;
• Evidence was also found to confirm that organisations with better site management plans demonstrate better environmental performance when compared to those with weaker site environmental management.
• The REMAS study however did for various reasons not succeed to demonstrate that better site environmental management and hence better environmental performance result in improved legal compliance.

The local response in the media that shocked the South African EMS community in 2007 was the findings of gross and sustained legal non-compliances by some organisations certified to ISO 14001:2004 as reported by Environmental Inspectors (Green Scorpions) established in terms of section 31(A-Q) of the National Environmental Management Act 107 of 1998. The Business Report\textsuperscript{45} reported on the 5\textsuperscript{th} of October 2007 that:

The state's environmental management inspectorate has named three companies as serious transgressors of environmental laws and permits, all three of which are ISO 14001 certified... The department of environmental affairs and tourism, which houses the Green Scorpions, said it was "taken aback" at the levels of non-compliance... The department has raised its concerns about ISO 14001 with the SA National Accreditation System (Sanas). Sanas certifies the country's 32 accreditation agencies.

At the time of writing this article the website of the South African National Accreditation System (SANAS) recorded only five of the reported 32 EMS certification bodies to indeed be accredited by SANAS.\textsuperscript{46} The implication is that

\textsuperscript{45} Salgado 2007 www.busrep.co.za/
\textsuperscript{46} SANAS 2009 www.sanas.co.za/
the other certification bodies are either not accredited at all, or that they may be accredited by foreign accreditation bodies that do not have a jurisdiction in South Africa. In South Africa, ISO 14001:2004 clearly failed to provide assurance that certified organisations do indeed consistently comply to applicable legal requirements.

Perhaps the clearest indication of sentiments at the time of writing this article regarding the inability of an ISO 14001:2004 based EMS to deliver legal compliance comes from the European Co-operation for Accreditation statement that:

The control of legal compliance by the organisation is an important component of the EMS assessment and remains the responsibility of the organisation...It should be stressed that certification body auditors are not inspectors of the environmental regulator. They should not provide ‘statements’ or ‘declarations’ of legal compliance.

There is however no simple and quick solution to remedy the failure of ISO 14001:2004 to function as an effective and efficient voluntary compliance tool. The factors that may require redress should include amongst others:

- Strengthening the requirements of ISO 14001:2004 to explicitly require demonstrated legal compliance as a prerequisite for certification, should international consensus be reached to strengthen the legal compliance requirements of both the ISO 14001 standard and the rules that govern certification and;
- National accreditation bodies need to require that certification bodies actively confirm sustained legal compliance during certification and surveillance audits and that demonstration of sustained legal compliance be a critical requirement to achieve certification or to retain certification,

47 The introductory page to the SANAS website states that: “The South African National Accreditation System (SANAS) is recognised by the South African Government as the single National Accreditation Body that gives formal recognition that Laboratories, Certification Bodies, Inspection Bodies, Proficiency Testing Scheme Providers and Good Laboratory Practice (GLP) test facilities are competent to carry out specific tasks.”
48 European Co-operation for Accreditation 2007 www.sccm.nl/
instead of the current focus of certification bodies to verify conformity to procedural requirements of the standard.

- Assurance that certification auditors are indeed competent\(^\text{49}\) to actually judge whether all applicable legal requirements have been identified and whether the organisation is indeed compliant.

- Legislation needs to be adopted to require that all bodies offering EMS certification services in South Africa must be accredited by SANAS, regardless of both international accreditation and or multi-lateral agreements that may exist between countries.

- Improved assurance of the competence of EMS certification auditors to adequately review legal compliance issues is imperative.

- Legislation needs to be adopted requiring that only SAATCA certified EMS auditors be used to conduct certification audits.

- SAATCA must ensure that a SANAS accredited certification scheme for EMS auditors in line with the IPC’s competence based requirements is operational and effective to rigorously examine and certify competent EMS auditors.

The current version of ISO 14001:2004 is due for revision between 2008 and 2012. Early indications at the time of writing this paper however, do not suggest any departures from the current weak requirements regarding the capability of EMSs to serve as an effective voluntary based environmental enforcement tool driving sustained legal compliance. For the interim the adoption and use of EMSs as an effective and reliable enforcement tool continue to rely on the creative fusion of a carefully selected portfolio of a range of different alternative environmental compliance based tools that are embedded in a sound command and control framework which promises prosecution, should the voluntary based tools fail to deliver sustained compliance.

\(^{49}\) The current qualifications based set of criteria used by auditor certification bodies to certify EMS auditors is at the time of writing this article being reviewed and revised in with the International Personnel Certification Association’s new competence based requirements. See IPC 2009 www.ipcaweb.org/ and also see the requirements of the SAATCA 2009 www.saatca.co.za/
6 Use of multiple compliance tools: The Mooirivier Mall case study

This case study illustrates how and to what extent voluntary, command and control based, as well as civil based compliance enforcement tools have been integrated into a seamless portfolio of enforcement tools designed to deliver sustained, reliable and demonstrable legal compliance throughout the life cycle of the project.

The fact that the adoption and use of these alternative enforcement tools are indeed mandated by command and control based authorisations issued in terms of national legislation is immaterial as they fundamentally retain an agreement and civil based character. One of the insights offered in this article is that a command and control basis to drive the adoption and use of such tools is indeed desirable.

6.1 The mall development and site characteristics

A retail facility of approximately 48500m$^2$ was built in Potchefstroom, South Africa on an environmentally controversial property. Although the preferred and selected development site is characterised by numerous financial and social positives\(^{50}\) it also posed significant environmental constraints and challenges to the development. Firstly, the site is located within the Mooi River open space system of the city. Secondly the mall is situated within the 1:50 and 1:100 flood lines of the river\(^{51}\) and thirdly a 60 m wide section of the mall spans the river to link the eastern and western banks.\(^{52}\)

Apart from the potential hydrology and flooding impacts of the specific development, malls are also associated with other known impacts caused by

---

50 Prinsloo “Market Research” 1-4. Historically retail facilities did not offer a feasible one-stop shopping destination for the Potchefstroom shopper, which resulted in an outflow of disposable income to surrounding cities such as Johannesburg. It was argued by key stakeholders that with better retail facilities, such as the Mooirivier Mall development, more of the disposable income would be retained in Potchefstroom itself, which will ultimately lead to a better economic and social climate in Potchefstroom.

51 Holm Jordaan Group “Urban Design” 35-44.

52 Wessels and Mkhari “Environmental Management Training” 4-6.
facilities, activities, products and services during the design, construction and operational phases. In general, all phases of the project life cycle of shopping malls generate large quantities of waste, consume large volumes of water and electricity as well as other natural resources. Finally, storm water management and potential contaminated water entering the river poses severe threats to the river’s ecological functionality. Innovative and comprehensive environmental enforcement instruments are, therefore, needed throughout the project life cycle of large-scale infrastructural developments to ensure sustainable protection of the environment, especially for developments located in highly sensitive areas such as the Mooi River flood plain.

6.2 Planning instruments: Mandatory environmental authorisations and processes as command and control instruments

During the planning phase of a large-scale development numerous authorisations, including environmental authorisations need to be obtained in order to legally develop and operate. The Mooirivier Mall development was identified at the initiation phase of the project as an activity that may have significant detrimental effects on the environment in terms of section 21 of the Environment Conservation Act 73 of 1989. Therefore, a mandatory Environmental Impact Assessment process was followed to obtain the required Record of Decision from the North-West Province’s Department of Agriculture, Conservation and Environment, which is the provincial competent authority.

Other mandatory environmental authorisations required include: a water use licence authorisation, a heritage impact assessment exemption, an exotic

53 Hereafter EIA.
54 Hereafter the ROD.
55 The specific activity was listed in GN R1182, published in terms of section 21 of the ECA as activity subs-s 2(c): “The change of land use from agricultural or zoned undetermined use to any other land use”.
56 Hereafter referred the WULA. The WULA was obtained from the Department of Water Affairs and Forestry, henceforth the DWAF (a South African National department that was responsible for managing water at the time of writing the article).
57 Obtained from the South African Heritage Resources Agency.
species exemption authorisation,\textsuperscript{58} a rezoning permit and a site development plan.\textsuperscript{59} The abovementioned environmental authorisations had to be obtained from different competent authorities from different spheres of government. This fragmentation collectively provides for a broader spectrum of environmental enforcement strategies, approaches and tools than what may be offered by a single government function. This is illustrated by the differences in requirements stipulated in the ROD and WULA specifications respectively. The ROD specified broad water and effluent management principles and tended to focus more on waste and biodiversity management, whereas the WULA focused much more on detailed site specific water and effluent management conditions. However, collectively the ROD and WULA covered a wider range of environmental conditions to be enforced by different spheres and line functions of government as DWAF is a national department and NWDACE is a provincial department. The same argument may be made for the heritage exemption, which focused on heritage protection and the rezoning authorisation, as well as the SDP issued by the local government, which in turn focused on strategic environmental planning considerations. This supports the redundancy hypothesis posted by Taylor\textsuperscript{60} referred to elsewhere in this article.

A critical command and control element to be considered in all the required authorisations is that the terms and conditions of the consent decisions of the competent authorities must be complied with during all stages of the project. The next section explains the EIA process and the critical link between EIA and EIA follow-up.

\textit{6.2.1 Closing the loop: EIA and EIA follow-up}

EIA is a planning instrument designed for taking account of the potential environmental consequences of a proposed action during the planning, design,\textsuperscript{61} decision-making and implementation stages of that listed action. In

\textsuperscript{58} Obtained from the Department of Agriculture.
\textsuperscript{59} Hereafter the SDP. The rezoning permit and the SDP were obtained from the local authority.
\textsuperscript{60} Taylor (n 18).
\textsuperscript{61} The planning and design phase is also termed; the \textit{pre-decision stage} of an EIA process.
addition to the project life cycle, PDCA and product cycle loops, the decision-making governing cycle should also be considered in selecting enforcement instruments. The decision-making governing cycle entails collecting information to make an informed decision, making the decision, and enforcing post decision conditions and requirements of that decision. Key to the governance cycle is the post-decision enforcement stage of assessment instruments such as EIA. Historically the EIA follow-up process received little attention from governing agents and it is argued that this fatal flaw may be a significant contributor to failures of the South African enforcement process. A critical lesson learned in the case study was to design and plan for the adoption and use of post-decision enforcement instruments in the pre-decision stage of the EIA process.

Another lesson learned is that it is essential to ensure the successful handover of environmental authorities, duties and responsibilities from role players of the pre-decision stage to relevant role players of the post-decision stage of the project to ensure that the loops are closed across continuum of governing, design, site preparation, construction, etc.

The following section of the case study briefly explains the role of environmental management plans as an enforcement instrument.

6.3 Implementation, checking and reporting instruments and the role of the EMP

Once the mandatory environmental authorisations have been issued by the relevant authorities the EMP may be regarded as the single most important implementation instrument for ensuring post-decision environmental enforcement. The EMP is recognised by the Department of Environmental Affairs and Tourism as the instrument of choice to demonstrate that impacts

---

62 See also argument made in section 4 of the article.
63 Better known as EIA follow-up as part of the EIA process.
64 Hereafter EMP.
65 Hereafter the DEAT. The Department of Minerals and Energy also requires that an EMP be drafted and implemented as a prerequisite for a mining permit and that an environmental management programme be developed and implemented as a prerequisite for a mining right.
are indeed monitored and managed and that proponents have made suitable provision for mitigation of environmental impacts. In essence the EMP is the canvas for integrating various environmental management instruments such as, setting objectives and targets, clarifying roles and responsibilities, establishing environmental authority on a site and setting relevant time-scales throughout the project life cycle. The EMP is also the critical link between the predicted impacts, the specified mitigation measures and the operational activities of the project.

Like environmental authorisations the EMP may be classified as a command and control instrument as EMPs are required by law for listed activities. EMPs then become legally enforceable by the relevant authorities. However, the EMP may be used as the vehicle to identify, introduce and formalise the adoption and use of various voluntary or self regulatory compliance based instruments on a construction site. Some of the voluntary self regulatory instruments that have been formalised by the EMP of the Mooirivier Mall development include:

- Specified site specific principles\(^{66}\) that needed to be adhered to;
- Method statements;\(^{67}\)
- Mandatory employee training;\(^{68}\)
- Numerous monitoring instruments including regulatory and mandatory inspections, audits and physical as well as biophysical monitoring studies;\(^{69}\)

---

\(^{66}\) The EMP includes critical site specific principles that must be adhered to throughout the project life cycle. A lesson learned during the project is that legal requirements are often not flexible enough to deal with dynamic site specific situations. Principles however, are clear and flexible objectives that are not easily challenged by violators.

\(^{67}\) A method statement is a letter of intent specifying the details of the activities of the planned works to be undertaken (including how and where the works will be undertaken). It also specifies the estimated time-frame for the activity and must be signed off by the responsible person undertaking the task as well as the relevant approving authority.

\(^{68}\) Ideally the entire workforce (including top management) should undergo an environmental awareness training course to understand how they may play a role in achieving the objectives specified in the EMP.

\(^{69}\) Monitoring in EIA refers to repetitive measurement undertaken primarily to address uncertainty in environmental impact predictions. Each specific project, must select its own portfolio of monitoring and measurement instruments.
• Numerous reporting and communication instruments including site visits, site notice boards, site meetings, complaints registers and compliance certificates;
• Enforcement by outsiders\(^70\) and establishment of an environmental monitoring committee;\(^71\)
• Violation\(^72\) response instruments\(^73\) such as non-compliance letters, fines\(^74\) and suspension of works.\(^75\)

6.4 Lessons learned from the case study

Some of the lessons learned from the case study provide support for the insights distilled in the previous sections of this article.\(^76\) Firstly, there is no one tool or category of enforcement tools which will result in a near perfect enforcement solution for a large scale development site such as the Mooirivier Mall as each project and site conditions differ.

---

\(^70\) Nongovernmental groups and/or civil society may have the will and resources and could, therefore, become involved in enforcement by detecting non-compliance, negotiating with violators, commenting on government enforcement actions, and where the law allows, taking legal action against a violator for non-compliance or against government for not enforcing the requirements.

\(^71\) Monitoring committees are excellent voluntary agreement instruments and serve as a vital communication platform between post-decision enforcement role-players.

\(^72\) There are numerous reasons why society in general does not comply to legal requirements. The US EPA 1992 [www.incece.org](http://www.incece.org) 1-16, list economics, social/moral, personal, management or technical elements as the main barriers to compliance and factors encouraging non-compliance. An interesting debate raised by the US EPA is that in any regulatory situation some people will comply voluntarily, some will not comply and some will comply only if they see that others receive a sanction. This change in behaviour to avoid sanction – is called *deterrence*.

\(^73\) Various types of formal and informal violation responses exists including informal mechanisms such as; telephone calls, inspections, warning letters and notices of violations, fines, suspension of work, and formal mechanisms such as civil or criminal proceeding.

\(^74\) Fines are a typical example of a market based disincentive instrument which gives authority to an elected person to issue a monetary penalty to violators. The designated environmental management authority in a development should be able to impose fines on any violators for any contraventions of the EMP.

\(^75\) Non-compliance with the conditions of the EMP constitutes a breach of contract as the EMP is a contractual condition to be adhered to on the Mooirivier Mall development site. The EMP states that the project engineer has the power to remove from site any person who is in contravention of the EMP, and if necessary, the PE can suspend part or all of the works, as required.

\(^76\) Refer to section 4 of the article, which discuss the framework conditions to direct the selection and use of alternative enforcement tools.
Secondly, as discussed in section 6.3 an innovative cocktail of site specific environmental enforcement tools must be selected in order to ensure independent subsystem duplication and overlap.

A third lesson learned is that these instruments should be supported by a mandatory command and control instrument such as the EMP for ensuring legal deterrence. On a construction site as in most cases, command and control instruments and hence the fear of prosecution, remain the principle enforcement driver.77

A fourth lesson learned is that the greater the number of role players involved in enforcement, the greater are the chances of a successful enforcement effort. Role players including the different line functions and spheres of government as well as civil society, must, however, be offered a unified communication platform, such as a monitoring committee, in order to ensure maximum enforcement potential.

The fifth and final lesson learned in the case study is that cognisance must be taken of the complexities of the four process sequences (project life cycle, product life cycle, plan, do check and acting management cycle, and the governing decision-making cycle) when selecting a site specific portfolio of environmental enforcement instruments to be used.78 For example, the enforcement tools used79 in the Mooirivier Mall case study covered the governance decision-making life cycle, project life cycle and the plan, do check and acting management cycles.

7 Conclusion

77 Also see the discussion in section 6.3 of the case study.
78 This lesson jointly encapsulates the fourth, fifth and sixth lesson discussed in section 4 of the article.
79 See also sections 6.2 and 6.3 of the article.
It is argued and demonstrated by means of both the lessons learned from the Mooirivier Mall case study and the distillation of generic imperatives to define framework conditions for the successful adoption and use of alternative enforcement tools, that an ensemble of environmental enforcement instruments should be carefully and innovatively selected, adopted and used to ensure and drive successful environmental enforcement. These instruments should also be selected from the four classes of enforcement tools and should consider the complexities of the four process sequences. Furthermore, evidence suggests that a stand alone instrument such as environmental management systems in general, and ISO 14001:2004 based EMSs particularly, do not ensure sustained environmental compliance. It was also argued that the deployment of mixed portfolios of enforcement tools is depended on both the number and independence of role players involved and that duplication and overlap of enforcement mandates may indeed be desirable from a sustained enforcement delivery perspective. The case study discussed also highlights the fact that command and control tools remain the principal driver of compliance by organisations and that a sound command and control basis remains a fundamental imperative against which agreement and civil based enforcement tools may be successful.
Bibliography

Croci *Environmental Voluntary Agreements*


Du Plessis and Nel “Driving compliance”

Du Plessis W and Nel JG “Driving compliance to and enforcement of South African legislation by means of a hybrid of ‘new’ environmental governance instruments” (Unpublished paper delivered at the Fourth Colloquium and Collegium of the IUCN Academy of Environmental Law, Pace Law School October 2006 New York)

ELNI *Environmental Agreements*


Fischer *Environmental Management Co-operative Agreements*


Gunningham and Grabowsky *Smart Regulation*

Gunningham N and Grabowsky P *Smart Regulation* (Claredon Oxford 1998)

Hanks 1998 *SAJELP*


Hanks *Negotiated Environmental Agreements*

Hanks J A *Role for Negotiated Environmental Agreements in Developing Countries?* (MSc thesis University of Lund Sweden 2000)
Holm Jordaan Group “Urban Design"


Kotze et al 2007 SAJELP


Kotze Legal Framework


Nel and Du Plessis 2004 SAPL

Nel JG and Du Plessis W “Unpacking integrated environmental management: A step closer to effective co-operative governance?” 2004 South African Public Law 181-190

Nel and Du Plessis 2001 SAJELP


Nel and Kotze “Environmental Management”


Nel and Le Roux “Municipalities as the regulator and regulated”

Nel JG and Le Roux E “Municipalities as the regulator and regulated –
Some thoughts on the complexity of sustainability challenges” (Unpublished paper delivered at the International Association of Impact Assessment of South Africa Conference 29-31 August 2005 Thaba’Nchu) 347-354

Prinsloo “Market Research”


Taylor Making bureaucracies think

Taylor S Making bureaucracies think: The environmental impact strategy of administrative reform (Stanford University Press California 1984)

Ten Brink Voluntary Environmental Agreements

Ten Brink P (ed) Voluntary Environmental Agreements, Process, Practise and Future Use (Greenleaf Sheffield 2002)

Wessels and Mkhari “Environmental Management Training”

Wessels JA and Mkhari B “Environmental Management Training – A Civil Based Instrument to Ensure Environmental Protection and Legal Compliance: The Mooirivier Mall Case Study” (Unpublished paper delivered at the 4th World Environmental Education Congress: Learning in a Changing World 2-6 July 2007 Durban South Africa) 4-6

Register of legislation

Environment Conservation Act 73 of 1989
National Environmental Management Act 107 of 1998
National Environmental Management: Air Quality Act 29 of 2004

Register of internet sources

AccountAbility Assurance Standard 2007 AA 1000 Series
Ceres 2007 [www.ceres.org/]

EMAS 2007 [www.emas.org.uk/]

ENDS Report 332 2007 [www.endsreport.com/]

ENDS Report 382 2007 [www.endsreport.com/]
   ENDS Report 382 2007 EMS survey brings mixed news for certifiers November 2006 [www.endsreport.com/] [date of use 18 Sep 2007]

European Co-operation for Accreditation 2007 [www.sccm.nl/]

Global Reporting Initiative 2007 [www.globalreporting.org/]

IPC 2009 [www.ipcaweb.org/]
   IPC 2009 The International Personnel Certification Association [www.ipcaweb.org/] [date of use 29 May 2009]

ISO 14001 2004 [www.iso.org/iso/]
   International Organisation for Standardisation 2004 Environmental management systems – Requirements with guidance for use
www.iso.org/iso/iso_catalogue/management_standards/iso_9000_iso_14000.htm [date of use 20 Sep 2007]

REMAS 2009 remas.iema.net/
REMAS 2009 Linking environmental management and performance remas.iema.net/ [date of use 4 June 2009]

SAATCA 2009 www.saatca.co.za/
SAATCA 2009 Southern African Auditor and Training Certification Association www.saatca.co.za/ [date of use 29 May 2009]

SAI 2007 www.sa-intl.org/

Salgado 2007 www.busrep.co.za
Salgado I 2007 Green Scorpions raise red flag on habitual polluters www.busrep.co.za/index.php?fArticleId=4065261 [date of use 5 Oct 2007]

SANAS 2009 www.sanas.co.za/

UKAS 2009 www.ukas.com
UKAS 2009 United Kingdom Accreditation Service www.ukas.com [date of use 29 May 2009]

UN Global Compact 2008 www.unglobalcompact.org/
UN Global Compact 2008 What is the UN Global Compact? www.unglobalcompact.org/docs/news_events/8.1/GC_brochure_FINAL.pdf [date of use 20 Nov 2008]
**List of abbreviations**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEAT</td>
<td>Department of Environmental Affairs and Tourism</td>
</tr>
<tr>
<td>DWAF</td>
<td>Department of Water Affairs and Forestry</td>
</tr>
<tr>
<td>ECO</td>
<td>Environmental control officer</td>
</tr>
<tr>
<td>EIA</td>
<td>Environmental impact assessment</td>
</tr>
<tr>
<td>ELNI</td>
<td>The Environmental Law Network International</td>
</tr>
<tr>
<td>ELO</td>
<td>Environmental liaison committee</td>
</tr>
<tr>
<td>EMAS</td>
<td>European Union’s Eco-Management and Audit Scheme</td>
</tr>
<tr>
<td>EMCA</td>
<td>Environmental cooperation agreements</td>
</tr>
<tr>
<td>EMP</td>
<td>Environmental management plan</td>
</tr>
<tr>
<td>EMS</td>
<td>Environmental management system</td>
</tr>
<tr>
<td>GLP</td>
<td>Good laboratory practice</td>
</tr>
<tr>
<td>GRI</td>
<td>Global reporting initiative</td>
</tr>
<tr>
<td>IAIA</td>
<td>International Association of Impact Assessment</td>
</tr>
<tr>
<td>ISO</td>
<td>International organisation of standardisation</td>
</tr>
<tr>
<td>NEMA</td>
<td>National Environmental Management Act</td>
</tr>
<tr>
<td>PDCA</td>
<td>Plan, do check act</td>
</tr>
<tr>
<td>PE</td>
<td>Project engineer</td>
</tr>
<tr>
<td>ROD</td>
<td>Record of decision</td>
</tr>
<tr>
<td>SA 8000</td>
<td>Social accountability 8000</td>
</tr>
<tr>
<td>SAATCA</td>
<td>Southern African Auditor and Training Certification Association</td>
</tr>
<tr>
<td>SANAS</td>
<td>South African National Accreditation System</td>
</tr>
<tr>
<td>SANS</td>
<td>South African National Standards</td>
</tr>
<tr>
<td>SDP</td>
<td>Spatial development plan</td>
</tr>
<tr>
<td>sub-s</td>
<td>Subsection</td>
</tr>
<tr>
<td>UKAS</td>
<td>United Kingdom Accreditation Service</td>
</tr>
<tr>
<td>WULA</td>
<td>Water use license application</td>
</tr>
</tbody>
</table>