The Mining Legacy in South Africa – A Superfund Sized Problem or a Trust Fund Baby?

A critical analysis of the market-based instruments applicable to mining, with specific focus on financial security mechanisms and suggestions for a new approach

Katherine Swart

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Supervisor: Alexander Paterson

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I hereby declare that I have read and understood the regulations governing the submission of LLM Environmental Law dissertations, including those relating to length and plagiarism, as contained in the rules of this University, and that this dissertation/research paper conforms to those regulations.

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Katherine Swart **Date**

Abstract

South Africa's economy is built on mining, and the practice has contributed to the creation of countless jobs and industries. However, the toll on the environment has been enormous, leaving the current government with a legacy of ownerless and abandoned mines which are damaging the environment, especially through the resulting acid mine drainage and karstification, and a mining industry which often fails to properly comply with environmental legislation. This dissertation examines the market-based instruments used in the context of mining, and critically analyses the efficacy and appropriateness of the tools used to compel mines to prevent and mitigate environmental harm and to rehabilitate the disturbed land once mining is complete. With a focus on the incentive-based instruments, and especially the financial provisions (or performance bonds) under the Mineral and Petroleum Resources Development Act, the dissertation goes on to argue that these measures are not enough to combat the inherent problems caused by mining, in particular acid mine drainage. A number of market-based instruments used in other jurisdictions are examined, with a focus on performance bonds, environmental funds, environmental tax, tax incentives and mitigation banking, and their feasibility and possible utility in South Africa is critiqued. Amongst the suggestions for future developments, it is proposed that an environmental fund such as the superfund used in the United States of America (in relation to hazardous waste) be introduced, either as an alternative to, or in conjunction with, the current financial provisions. This would deal with the perpetual nature of many of the environmental problems and would lighten the financial burden on government, allowing rehabilitation and mitigation measures to be carried out in situations where financial provisions are insufficient or non-existent.

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List of Abbreviations

AMD	Acid Mine Drainage
Constitution	Constitution of the Republic of South Africa, 1996
EIA	Environmental Impact Assessment
ECL	Environmental Critical Level
EMP	Environmental Management Plan or Programme
EPA	Environmental Protection Agency
GDP	Gross Domestic Product
Guideline Document	Guideline Document for the Evaluation of the Quantum of Closure-Related Financial Provision Provided by a Mine (2005)
MBI	Market-Based Instrument
MEC	Member of the Executive Council
MPRDA	Mineral and Petroleum Resources Development Act 28 of 2002
MPRDR	Mineral and Petroleum Resources Regulations GNR527 of 2004
NBSAP	National Biodiversity Strategy Action Plan
NEMA	National Environmental Management Act 107 of 1998
NWA	National Water Act 36 of 1998
OECD	Organisation for Economic Cooperation and Development
PPP	Public Private Partnership
SDF	Spatial Development Framework
SEMA	Specific Environmental Management Act
TCTA	Trans-Caledon Tunnel Authority
USA/US	United States of America
WDCS	Waste Discharge Charge System

Chapter 1: Introduction

South Africa is a country blessed with both mineral wealth and an environment filled with undeveloped expanses of nature, rich biodiversity and unique ecosystems. The mineral wealth has formed the backbone of the country's economy for over 100 years,[1] creating jobs and allowing for much needed development.[2] However, the benefits from mining have come at a great cost to the environment,[3] especially the country's limited water resources, and the economic cost of this environmental degradation is now being passed on to the state.[4]

One of the biggest threats to the environment resulting from past and current mining activity is acid mine drainage (AMD), which occurs when sulphide-bearing material is exposed to oxygen and water, resulting in the water becoming acidic.[5] It is characterised by elevated concentrations of salts, heavy metals and radionuclides,[6] and poses a threat to the environment (especially biodiversity), health and property.[7] AMD is an international problem, but is becoming especially difficult in South Africa due to the large-scale closure of mining operations since the 1970s, the subsequent

[1] Swart E "The South African Legislative Framework For Mine Closure" 2003 *Journal of South African Institute of Mining and Metallurgy* 489-493.
[2] Although the direct contribution of mining has decreased as the national economy has expanded, it still accounts for a large proportion of the GDP, contributing 7.7% in 2007, according to Sorensen P "Mining in South Africa: A Mature Industry?" 2011 68(5) *International Journal of Environmental Studies* 632.
[3] Swart 2003 *JSAIMM* 489.
[4] A legacy of over 6,000 ownerless and abandoned derelict mines has been passed on to the State, who accept responsibility for mines once a closure certificate is issued, and who are also responsible where no legally responsible person can be identified, or it is impractical or inequitable to require a mine or a responsible person to carry out the rehabilitation, according to Dixon C "Mine Closure from a Legal Perspective" 2003 103(8) *Journal of the South African Institute of Mining and Metallurgy* 485. This has resulted in the state being responsible for rehabilitation costs of R1.456 billion. *Cf* Fourie M "R1.4 bn to rehabilitate abandoned mines" *Business Day* (2010.09.15). Acid mine drainage (AMD) is a related problem, but is perpetual in nature and is now threatening both the environment and economy, due to potential health and property damage. The long-term cost of dealing with this problem on the Witwatersrand has been estimated to be R1.08 billion without factoring the desalination of this polluted water. *Cf* Salgado I "Acid Water Clean-Up to Cost Blns" *Business Report* (2011.02.05).
[5] Ackil A & Koldas S "Acid Mine Drainage (AMD): Causes, Treatment and Case Studies" 2006 *Journal of Cleaner Production* 1139.
[6] Expert Team of the Inter-Ministerial Committee under the Coordination of the Council for Geosciences 2010 *Mine Water Management in the Witwatersrand Gold Fields with Special Emphasis on Acid Mine Drainage*("AMD Report") 1.
[7] Ackil & Koldas 2006 *JCP* 1139.

termination of the extraction of underground water from these mines, and the fact that many of them have been left unrehabilitated and are now the responsibility of the state.[8] The problem was first highlighted in 2002, when water began to decant from an abandoned shaft in the Mogale City / Randfontein area as a result of flooding of the mines in the basin.[9] Since then the problem has received much attention in the government,[10] but because of the fact that many mines contribute to the problem, and the fact that the situation is perpetual in nature (since the water must be pumped and treated in order to avoid a decant into the environment at large) it is an on-going battle to fund and manage AMD.

Although serious environmental problems exist currently, there has been a tangible shift in government's approach towards environment governance and the regulation of mining, culminating in the Mineral and Petroleum Resources Development Act (MPRDA)[11] and the Regulations promulgated under it.[12] The focus has shifted from ensuring economic growth regardless of the environmental costs, as was the apartheid government's approach when dealing with the mining industry with which it had a mutually beneficial relationship,[13] to the current stance which embraces the

[8] Team of Experts 2010 *AMD Report*.

[9] Winde & Stoch "Threats and Opportunities for Post-Closure Development in Dolomitic Gold Mining Areas of the West Rand and Far West Rand" 2010 36(1) *WaterSA* 70.

[10] An inter-ministerial committee on acid mine drainage has been set up, and a Team of Experts, representing both the Department of Water Affairs and the Department of Mineral Resources, published the *AMD Report*, which was approved by Cabinet on 9 February 2010. Various presentations have been made to the Parliamentary Portfolio Committee on Water and Environmental Affairs regarding AMD, including presentations by National Treasury, and the Minister of Water and Environmental Affairs appointed the Trans-Caledon Tunnel Authority, by means of Ministerial Directive on the 6 April 2011, to implement the immediate and short term actions recommended in the AMD Report. According to the Department of Water Affairs 2011 *Progress Report on the Management of Acid Mine Drainage (AMD) in the Witwatersrand Mining Region to the Portfolio Committee: Water and Environment*, AMD is currently decanting at surface level in the Western basin, and Environmental Critical Level (ECL) above which there is a threat to the environment, will be reached in the Central Basin by August of 2012, and the Eastern Basin by December 2013. Although measures are being taken by the Tran-Caledon Tunnel Authority (TCTA), it is clear that the problem requires the co-operation of the private sector and urgent action by government.

[11] Mineral and Petroleum Resources Development Act 28 of 2002 (MPRDA).

[12] Mineral and Petroleum Resources Development Regulations GN R527 in *Government Gazette* 26275 of 23 April 2004.

[13] Van Eeden et al "Legal Issues Concerning Mine Closure and Social Responsibility on the West Rand" 2009 5(1) *TD: The Journal for Transdisciplinary Research in Southern Africa* 52; Adler R, Claassen M, Godfrey L & Turton A "Water, mining, and waste: an Historical and Economic Perspective on Conflict

environmental right under the Constitution of the Republic of South Africa, 1996 (the Constitution)[14] and embraces the principle of sustainable development.

However, this shift in approach takes place in the reality of serious environmental degradation caused by mining. The state's liability for ownerless and abandoned mines stems from a historic lack of environmental regulation. Prior to the current mining regime of the MPRDA and its Regulations, mining and closure of mines were governed by the Minerals Act,[15] and there was widespread use of irresponsible mining methods, with little regard to the protection of the environment, and companies often failed to rehabilitate mining areas before being liquidated or leaving the country.[16] Mine closures before 1956 were not subject to legislative closure requirements, and are now the responsibility of the state.[17]

Adding to this problem is the fact that many mining companies refuse to take responsibility for acid mine drainage and other environmental and health problems associated with mining,[18] since it is something which is caused by multiple sources. A solution will have to involve both government and the mining sector.[19] Co-operation between the mining sector and the government is necessary because the Department of Mineral Resources on its own does not have sufficient resources to rehabilitate the ownerless and abandoned mines around South Africa, which number around 6000 and would cost R1.5 billion to rehabilitate.[20] Of these 6000 sites, many may not have

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Management in South Africa" 2007 2(1) *The Economics of Pease and Security Journal* 33 at 34. The government profited enormously from mining in the past, with taxes of up to 57% being imposed on mining profits. The relationship with the mining industry was therefore profitable, leading to an abandonment of regulatory responsibility in the environmental context.

[14] Section 24 of the Constitution of the Republic of South Africa, 1996.

[15] Minerals Act 50 of 1991

[16] Swart 2003 *JSAIMM* at 489; Limpitlaw et al "Post-mining Rehabilitation, Land Use and Pollution at Collieries in South Africa" 2005 *Colloquium: Sustainable Development in the Life of Coal Mining* 2.

[17] Swart 2003 *JSAIMM* at 489.

[18] Van Eeden et al 2009 *TDRSA* at 52.

[19] The need for Public Private Partnerships (PPP) has been recognised by the National Treasury, who suggested that such opportunities should be explored as a matter of urgency, as well as proposing the use of an environmental superfund to combat AMD. *Cf* National Treasury 2011 *Acid Mine Drainage: Funding & Recommendations* (Presentation to Parliamentary Portfolio Committee on Water & Environmental Affairs) 11-12.

[20] I-Net Bridge *Miningmx.com* (2010.09.15).

traceable owners or people who can be held responsible for rehabilitation, since many do not have sufficient funds, not having had to set aside the money for post closure environmental management.[21]

The tools which are used to control the effects of mining on the environment have also evolved, with the introduction of market-based instruments (MBI) aimed at achieving a more efficient regulation and correction of the market failure which led to the exclusion of the cost to the environment from the price of the commodities which were mined.[22] MBIs have been defined by the National Treasury as "a group of policy instruments that seek to correct environmentally-related market failures through the price mechanism".[23] They are becoming increasingly popular as an alternative set of tools in environmental management, both internationally and in South Africa.[24] These tools are suggested as complimentary mechanisms, to be used alongside the existing command-and-control regulations, as a means of strengthening them and overcoming their shortcomings. Several potential complimentary MBIs are suggested by the dissertation to address the current problems in the mining sector. One means of overcoming the problems caused by ownerless and abandoned mines, and AMD, is a superfund model, based on the United States of America's approach to hazardous waste. This would allow companies currently operating in the mining sector, or who have operated in the past and who own unrehabilitated mines, to contribute financially to the government's rehabilitation efforts and the on-going costs of treating AMD.[25]

[21] Coetzee H "Mine Water Management in South Africa"2009 *Freiberg Online Geology* 27.
[22] Adler et al 2007 *EPSJ* 35 argue that the production costs have historically been held artificially low by the mining companies through the deflection of certain costs, such as rehabilitation of the environment and social welfare, to the state and third parties. It could be argued that this practice continues, since environmental liability may be passed on to a third party, and may be lowered to make this prospect more lucrative to potential buyers.
[23] National Treasury (Tax Policy Chief Directorate) 2006 *A Framework for Considering Market-Based Instruments to Support Environmental Fiscal Reform in South Africa – Draft Policy Paper* ("Draft Policy Paper") 2.
[24] Whitten SM, Van Bueren M & Collins D "An overview of market-based instruments and environmental policy in Australia" 2004 *Market-based Tools for Environmental Management. Proceedings of 6th Annual AARES Symposium* RIRDC, Canberra, Australia at 1; Paterson A "Pruning the Money-Tree to Ensure Sustainable Growth: Facilitating Sustainable Development Through Market-Based Instruments" 2006 9(3) *Potchefstroom Electronic Law Journal* 89.
[25] The Minister of Finance stated in an answer to a parliamentary question of whether it intended to introduce an environmental levy to working mines to deal with AMD, that effluent produced by working

Mines operating currently under the MPRDA, or who can be traced as owners of unrehabilitated mining areas, are held liable for the costs of rehabilitation.[26] In order to ensure that companies have the financial means to rehabilitate mines after closure, and to guarantee that there will be sufficient funds in the event of an unexpected closure of the mine, a financial provision must be made by the person or company applying for a mining right, as part of their Environmental Management Programme or Plan (EMP).[27] The quantum of this financial provision is governed by a set of guidelines published by the Department of Mineral Resources in 2005, and may be in the form of either a trust fund, a financial guarantee from a bank, a direct deposit or any other method determined by the Director-General. These options are set out under the Regulations[28] promulgated under the Act, and the MPRDA includes insurance as a form of financial provision in the definitions in section 1. By far the most common form that these financial provisions take is that of trust fund, and this is perhaps to do with the fact that another MBI – a tax incentive – is used to encourage mining companies to comply with this law to the letter.[29]

The financial provision contained in the MPRDA[30] is a form of MBI known as a performance bond, which creates an incentive for mining companies to rehabilitate properly and to mitigate environmental damage caused by the operation. The incentive exists because the Minister may use all or some of the financial provision to rehabilitate disturbed land and environmental degradation, should the mine fail to do

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mines would fall within the Department of Water Affairs' new Waste Discharge Charge System (WDCS), while a different arrangement would have to be made to deal with AMD from abandoned mines. *Cf* Minister of Finance 2011 *Reply to Question Number 3471 by Mrs HN Ndude (Cope) to ask the Minister of Finance in National Assembly for Written Reply NW4145E (11 November 2011).*

[26] As mentioned in the note above, the liability of operational mines for AMD will soon fall under the WDCS to be introduced under the National Water Act 36 of 1998.

[27] Section 41 of the MPRDA 2002. This section is entitled 'Financial provision for the remediation of environmental damage' and is thoroughly examined below at 3.1.

[28] Regulation 53 of the Mineral and Petroleum Resources Development Regulations (MPRDR) GN R 527 in *GG* 26275 of 2004-04-23.

[29] The tax incentive was introduced under section 37A of the Income Tax Act 58 of 1962.

[30] Section 41 of the MPRDA and Regulation 53 and 54 of the MPRDR.

so satisfactorily,[31] and it is therefore in the financial interest of the mine to maintain and rehabilitate the area themselves, in order to get the performance bond back.

This form of MBI is also used in other jurisdictions, notably the United States of America, to ensure that land which is disturbed by mining is returned to its pre-mined state, including re-vegetation.[32] However, there are a variety of weaknesses in both the approach on its own, and in its implementation. The financial provision may be vulnerable to insolvency (despite the mechanism being designed specifically to deal with unexpected closure),[33] and the guidelines[34] published by the Department[35] have not been updated since 2005, leading to an insufficient quantum being put aside when rights holders fail to take inflation into account.

The slew of unrehabilitated ownerless and abandoned mines, along with the cessation of pumping at mines which are have closed, is resulting in serious threats to the environment. The traditional command and control instruments which dominate the regulation of mining are therefore proving insufficient, and the market-based mechanisms which are being utilised are not filling the gaps sufficiently to form a complementary and complete framework for the governance of mining rehabilitation and environmental protection.

This dissertation seeks to identify the MBIs which are currently used in South Africa to regulate the environmental impact of mining, and to critically evaluate their efficacy and appropriateness as tools to compel mines to prevent and mitigate environmental harm and to rehabilitate the disturbed land once mining is complete. The focus will lie with the main incentive-based tool of the performance bond currently used under the

[31] A portion of the performance bond may be withheld to deal with latent or residual environmental impacts, according to section 41 of the MPRDA.
[32] Di Leva "The Conservation of Nature and Natural Resources through Legal and Market-Based Instruments" 2002 11(1) *Review of European Community & International Environmental Law* 93.
[33] The vulnerability of each form of financial provision is discussed below in 3.3.1.
[34] Department of Minerals and Energy 2005 *Guideline Document for the Evaluation of the Quantum of Closure-Related Financial Provision Provided by a Mine* ("Guideline Document").
[35] This Guideline Document is contemplated in Regulation 54(1) to the Mineral and Petroleum Resources Development Act 28 of 2002, above.

MPRDA. This form of MBI is surveyed, and its effectiveness and interaction with other forms of MBIs (such as tax incentives) is discussed. A selection of alternative MBIs used in foreign jurisdictions are then examined to determine how the existing instruments in use in South Africa can be improved, and whether some or all of these new instruments could be introduced to remedy short-fallings which are resulting in non-compliance with the regime and leading to environmental degradation. The use of performance bonds and tax incentives in foreign jurisdictions is discussed and compared to their use in South Africa, and the introduction of environmental funds, environmental taxes and the habitat banks are contemplated. Finally the five options put forward for inclusion in the existing regulatory framework, or suggestions of how the existing MBIs may be improved, are assessed according to a set of criteria, and their feasibility is gauged. This dissertation will be limited to an examination of these instruments as they apply in the mining context currently, and to new MBIs which could be introduced into the regulatory context to complement the current system.

In line with the National Treasury's policy advocating the use of MBIs to complement direct regulatory efforts, the dissertation proceeds in Chapter 2 to examine the theory relating to these regulatory instruments. The chapter examines the forms of MBIs and why it has become necessary to introduce these instruments into the existing regulatory framework. Several criteria which influence the choice and design of these instruments are introduced and these are used in the subsequent chapters to evaluate the use of current and potential MBI in South Africa's regulatory regime governing mining.

Chapter 3 provides a brief overview of the current regulatory regime governing mining and the environment in South Africa. It provides the necessary context for the subsequent evaluation of the current and potential application of MBIs in the domestic mining context. Although there are a number of laws which are of relevance,[36] they are

[36] These include *inter alia* the National Environmental Management Waste Act 59 of 2008; National Environmental Management Air Quality Act 39 of 2004; National Environmental Management Protected Areas Act 57 of 2003; National Environmental Management Biodiversity Act 10 of 2004; National

simply too numerous to discuss in detail. I will therefore principally focus on South Africa's primary mining legislation, namely the MPRDA, the Mineral and Petroleum Royalties Act,[37] and the Minerals Act,[38] which is still applicable to a certain extent. The framework legislation governing the environment, the National Environmental Management Act,[39] is the most important statute in relation to the environment, and is discussed in relation to mining. Its relationship with the MPRDA is discussed, as are the attempted amendments to both Acts under the National Environmental Management Amendment Act.[40] The National Water Act[41] is also examined in relation to the regulation of mining. The chapter ends by examining the existing MBIs in operation in the current regulatory regime, and discussing their success or lack thereof, as well as any particular strengths or weaknesses. Several tax-based instruments exist in the context of environmental protection which may be of relevance to mining operations, including those which relate to property tax,[42] environmental capital expenditure[43] and biodiversity conservation.[44] However, the scope of this dissertation is limited, and therefore only those of direct relevance to mining rehabilitation are discussed.[45]

Environmental Management Integrated Coastal Management Act 24 of 2008; National Heritage Resources Act 25 of 1999; and Subdivision of Agricultural Land Act 70 of 1970.

[37] Mineral and Petroleum Royalties Act 28 of 2008.

[38] Minerals Act 51 of 1991.

[39] National Environmental Management Act 107 of 1998.

[40] National Environmental Management Amendment Act 62 of 2008.

[41] National Water Act 36 of 1998.

[42] Section 8 of the Local Government: Municipal Property Rates Act 6 of 2004 allows for differential rates to be charged by municipalities in relation to protected areas, thereby incentivising owners to declare their land under the National Environmental Management Protected Areas Act (NEMPAA) 57 of 2003. Section 15 of the Local Government: Municipal Property Rates Act further allows for municipalities to grant exemptions, reductions and rebates in terms of criteria set out in its rates policy, which includes protected areas.

[43] Section 37B of the Income Tax Act 58 of 1962 allows for the deduction from a taxpayer's income in relation to new and unused environmental treatment and recycling assets and waste disposal assets. This is especially relevant in the water treatment context of mining, since water contaminated by the mining process must be treated in order for mines to avoid falling foul of the National Water Act 36 of 1998.

[44] According to section 37C of the Income Tax Act 58 of 1962, a tax deduction is allowed where biodiversity management agreements are entered into between the owner of the land and the government. Where a protected areas agreement is entered into between the owner of land under NEMPAA, section 37C of the Income Tax Act 58 of 1962 allows for the deduction from the taxable income of costs incurred by the owner due to conservation and maintenance of the land.

[45] See 3.3.2 below.

Drawing from the practice undertaken in several foreign jurisdictions, Chapter 4 outlines which forms of MBIs have historically proven useful in the mining context. These MBIs include performance bonds, environmental funds, environmental taxes, tax incentives and the use of a habitat bank. Each of these options, and their theoretical merits, disadvantages and prerequisites for success are discussed.

The potential applicability and utility of the MBIs identified in Chapter 4 is critically evaluated in Chapter 5 according to the criteria laid out in Chapter 2 which influence their choice and design. The dissertation concludes by proposing which of these MBI's is most suitable for introduction in the South African context and how certain of the current MBI's in operation in South Africa could be amended to improve their utility.

Chapter 2: Theoretical context of market-based measures applicable to mining

Market-based instruments (MBIs) are rapidly growing, both internationally and in South Africa. However, they are generally designed to fill the gaps left by command-and-control measures, and to operate alongside these traditional regulatory tools, rather than to replace them. MBIs are also not always suitable, and the context and objectives which need to be achieved must be carefully examined in deciding whether and MBI is the right tool, and if so, how and when it will be introduced into the legal framework. The weaknesses of the traditional command-and-control tools are examined, and the corresponding strengths of MBIs are then discussed. Eight criteria have been identified by the National Treasury as key in deciding the suitability of MBIs, and these are used later on as evaluation tools in the context of the MBIs put forward for introduction or amendment in the South Africa legislative framework.

2.1 How Market-Based Instruments Fit Into the Legal Landscape

There is a growing realisation, both domestically and internationally, that the tools which have traditionally been used in environmental management are not achieving the goals of protecting the environment sufficiently. This has prompted a move away from the traditional 'command-and-control' approach, and a shift towards alternative mechanisms such as incentive-based tools and self-regulation.[46] However, it is recognised that incentive-based tools such as market-based instruments "are certainly not a panacea for environmental problems,"[47] and that in most cases they are most effectively utilised as a complimentary tool to command-and-control regulations.[48] This is the case both in South Africa and foreign jurisdictions, and in the sphere of

[46] Kidd *Environmental Law*2009 209-210.
[47] Dolšak N & Sampson K "The Diffusion of Market-Based Instruments: The Case of Air Pollution" 2011 20(10) *Administration & Society* 3.
[48] National Treasury 2006 *Draft Policy Paper* 2.

environmental regulation around mining several different kinds of enforcement techniques under both the command-and-control and incentive-based categories of regulation are used.

The command-and-control approach traditionally uses two processes – a command through regulations prescribing a range of legislative standards, prohibitions and restrictions, and control through an array of enforcement measures which are used in the event of non-compliance.[49] Sanctions are applied for contravention of the regulations,[50] either through criminal, administrative or civil measures.[51] This system involves strict monitoring by the authorities as to whether the law is being followed,[52] and is thus state-centred and directive-based.[53]

The alternative compliance mechanisms have come into use more recently, and involve economic instruments (or incentive-based measures) and self-regulation (or voluntary measures).[54] Self-regulatory mechanisms[55] are initiated by industry, which voluntarily prescribes objectives and mechanisms which should be used to achieve these; state involvement is generally absent.[56] Although an important component in changing the behaviour of industry, self-regulatory tools will not be discussed further here.

[49] Craigie, Snijman & Fourie "Dissecting Environmental Compliance and Enforcement" in Paterson & Kotze (eds) *Environmental Compliance and Enforcement in South Africa* 2009 51-52.
[50] Paterson 2006 *PELJ* 88.
[51] Craigie, Snijman & Fourie "Dissecting Environmental Compliance and Enforcement" in *Environmental Compliance and Enforcement* 52.
[52] Kidd *Environmental Law* 210.
[53] Paterson "An Incentive-Based Approach to Environmental Regulation" in Paterson & Kotze (eds) *Environmental Compliance and Enforcement in South Africa* 2009 297.
[54] Kidd *Environmental Law* 209; Craigie, Snijman & Fourie "Dissecting Environmental Compliance and Enforcement" in *Environmental Compliance and Enforcement* 58.
[55] Self-regulatory instruments include co-operative agreements, certification schemes and corporate environmental responsibility programmes. Some commentators also include information-based instruments, such as labelling schemes, under this heading, while others list these as separate tools. Closely related to the self-regulatory mechanisms are the co-regulatory instruments, under which the state prescribes objectives and standards, but the objectives used to achieve these are left to industry to decide. *Cf* Kidd "Alternatives to the Criminal Sanction in the Enforcement of Environmental Law" *South African Journal of Environmental Law and Policy* 28-31; Paterson "An Incentive-Based Approach to Environmental Regulation" in *Environmental Compliance and Enforcement* 298-300.
[56] Paterson "An Incentive-Based Approach to Environmental Regulation" in *Environmental Compliance and Enforcement* 298.

Incentive-based tools sit in between the command-and-control mechanisms and the self-regulatory tools, and use reward as an incentive to comply with state objectives and standards.[57] Although this category also includes regulatory-[58] and information-based[59] incentives, the main body of instruments can be classified as market-based instruments (also known as fiscal or economic incentives).[60]

Market-based incentives (MBIs) attempt to influence economic behaviour in order to achieve certain desirable goals.[61] The theory behind these tools is based on the economic theory around markets. This theory provides that markets are usually the most efficient, if not the most equitable, means of allocating scarce resources, since through the price mechanism they provide a strong incentive to all users to optimise the use of resources, leading to efficiency.[62] However, in practice, the market fails to adequately value various goods and services, resulting in these cost of the goods and services not being reflected in their price, and subsequent inefficient use and externalities.[63] Where such market failure occurs, a strong rationale exists for state intervention, in order to influence behaviour towards a more fair and efficient use of the under-valued goods and services.[64]

[57] *Ibid*.
[58] Regulatory incentives are those instruments which encourage individuals, industry and organisations to exceed the standards by offering to reduce the regulatory burden on those who demonstrate high levels of environmental performance and investment in environmental management. See Paterson "An Incentive-Based Approach to Environmental Regulation" in *Environmental Compliance and Enforcement* 304-305.
[59] Information-based incentives aim to change both producer and consumer behaviour through the collection and public distribution of information relating to environmental performance. See Paterson "An Incentive-Based Approach to Environmental Regulation" in *Environmental Compliance and Enforcement* 305-306.
[60] Paterson "An Incentive-Based Approach to Environmental Regulation" in *Environmental Compliance and Enforcement* 298.
[61] Henderson PGW "Fiscal Incentives for Environmental Protection – Introduction" 1994 1 *South African Journal of Environmental Law and Policy* 49.
[62] National Treasury *Draft Policy Paper* 7-8 and 41-43.
[63] Paterson "An Incentive-Based Approach to Environmental Regulation" in *Environmental Compliance and Enforcement* 299.
[64] Paterson "An Incentive-Based Approach to Environmental Regulation" in *Environmental Compliance and Enforcement* at 299.

A classic example of this market failure is in the context of the environment. Since there is open access to the environmental goods and services and most markets fail to accurately value environmental goods and services, and the environmental costs and benefits are not reflected in the prices.[65] This leads to greater than optimal levels of use and consumption,[66] undermining conservation efforts and in some cases using up non-renewable resources to the detriment of future generations. MBIs in the South African environmental governance context are therefore "a group of policy instruments that seek to correct environmentally-related market failures through the price mechanism".[67]

Various forms of market-based instruments exist, and different commentators divide them according to various criteria. Some divide the tools into those using positive and negative incentives,[68] while others categorise them according to their nature.[69] Although Paterson[70] has combined these typologies into an overarching categorisation which incorporates almost all forms of market-based instruments, a more simple classification system will be used in this dissertation, dividing market-based instruments into tax instruments and non-tax instruments. This is due to the National Treasury's preference of tax instruments as the market-based instrument of choice,[71] and the nature of the MBIs used in the mining context.[72]

[65] National Treasury 2006 *Draft Policy Paper* 41; Paterson 2006 *PELJ* 90.
[66] Henderson 1994 *SAJELP* 50.
[67] National Treasury 2006 *Draft Policy Paper* 2.
[68] Henderson "Fiscal Incentives for Environmental Protection – Conceptual Framework" 1995 (1) *South African Journal of Environmental Law and Policy* 55-69*;* Henderson "Fiscal Incentives for Environmental Protection – The Way Forward" 1995 (2) *South African Journal of Environemntal Law and Policy* 151-168. Henderson, in a previous paper (1995 (1) *SAJELP*) defines a positive incentives as "one that through the application of a fiscal measure a taxpayer is persuaded to adopt a particular act that has favourable environmental consequences". He defines a negative incentives as one that through the application of a fiscal measure, a taxpayer is discouraged from embarking or continuing with an act that has unfavourable environmental consequences".
[69] Benidickson *Environmental Law* 2009 361.
[70] Paterson "An Incentive-Based Approach to Environmental Regulation" in *Environmental Compliance and Enforcement* 39.
[71] National Treasury 2006 *Draft Policy Paper* 1.
[72] Discussed in 3.3 below.

MBIs in the form of tax instruments include environmental taxes imposed on environmental "bads" such as pollution emissions, and tax incentives or benefits, which include incentives in the form of eligibility for expenses deductions such as accelerated depreciation write-offs or other inducements used to stimulate particular forms of investment.

Non-tax based instruments include a range of tools with differing purposes and forms, lumped together in this dissertation purely because they are not tax based. This category includes performance bonds, environmental funds, offset agreements, deposit-refund systems and direct subsidies.

2.2 The Shift Towards Market-Based Instruments

The shift towards an incentive-based approach can be seen in many jurisdictions,[73] including South Africa. This is especially so in the environmental context, with National Treasury issuing several policy papers which explicitly outline its intention to use and develop MBIs for this means.[74] The need for such a shift stems from several short-comings in the command-and-control approach, as well as certain characteristics of incentive-based instruments, especially MBIs, which work well in the environmental context. However, it should be noted that despite the rise in prominence of MBIs, their effectiveness depends on the continued existence and enforcement of the traditional command-and-control tools, which they are designed to complement rather than replace.

[73] Paterson 2006 *PELJ* 89.

[74] National Treasury 2006 *Draft Policy Paper* is the most comprehensive policy document. However, this shift in emphasis from command-and-control mechanisms to alternative mechanisms is also clearly outlined in a number of policy documents. For a list of these policies see Paterson 2006 *PELJ* 92. Subsequent to this article, several others have been published, including: Department of Water Affairs and Forestry 2008 *National Water Resource Strategy* 1 ed; National Treasury 2010 *Discussion Paper Reducing Greenhouse Gas Emissions: The Carbon Tax Option*; and the South African Government's 2011 *National Climate Change Response White Paper*.

The traditional command-and-control instruments have several weaknesses. In the context of environmental protection, the first and most debilitating drawback is that they are predominantly reactive, and thus unable to prevent environmental degradation.[75] Secondly, the highly centralised regulations are often time-consuming and expensive to monitor and enforce, requiring well-resourced and capacitated enforcement authorities.[76] Third, this over-bureaucratic system is inflexible, failing to allow authorities to tailor the means of achieving goals to the varying sectoral, individual and geographic situations.[77] Fourthly, since command-and-control regulations often use technology- and performance-based standards, there is little or no incentive for firms to exceed their control targets, leading to little or no development or adoption of new and more effective technologies.[78] Fifthly, and importantly in the mining context, there is a traditional focus on supply-side controls, while demand management is ignored.[79] In the context of finite and rapidly dwindling supplies of natural resources, supply-side management is vital, and it is here that MBIs play an important role, through using the price mechanism to internalise the external cost to the environment, and potentially the loss suffered by future generations who will not have access to finite resources used up by the current generation. Finally, the command-and-control approach fails to remedy the market's failure to account for the use of environmental goods and services.[80] These environmental goods and services, which include soil, water, air, flora and fauna, and ecosystems as a whole, are common goods, and the market's failure to build in the cost of their use and pollution into the market price of products is resulting in the tragedy of the commons.[81]

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[75] Paterson "An Incentive-Based Approach to Environmental Regulation" in *Environmental Compliance and Enforcement* 307.
[76] Craigie, Snijman & Fourie "Dissecting Environmental Compliance and Enforcement" in *Environmental Compliance and Enforcement* 52.
[77] Stavins RN "Experience with Market-Based Environmental Policy Instruments" in Mäler & Vincent (eds) *Handbook of Environmental Economics: Volume 1* 358; Paterson "An Incentive-Based Approach to Environmental Regulation" in *Environmental Compliance and Enforcement* at 307.
[78] Paterson 2006 *PELJ* 89; Stavins "Experience with Market-Based Environmental Policy Instruments" in *Handbook of Environmental Economics* 358-359.
[79] Paterson "An Incentive-Based Approach to Environmental Regulation" in *Environmental Compliance and Enforcement* 307.
[80] Paterson 2006 *PELJ* 89; Stavins "Experience with Market-Based Policy Instruments" in *Handbook of Environmental Economics* 358-359.
[81] Kolstad *Environmental Economics* 2011 89.

In recognising the risk facing the environment, and the failure of the traditional command-and-control approach to remedy it, states are turning to incentive-based tools, especially MBIs, to fill the gaps. This new approach to environmental management "use[es] market principles to achieve environmental goals while avoiding many of the dysfunctions of centralized regulation".[82]

The most resounding endorsement of these new kinds of regulatory tools is that they are more efficient than command-and-control measures.[83] They seem to have characteristics which counter many of the weaknesses found in the traditional command-and-control tools, starting with the fact that they are pre-emptive rather than reactive, and are therefore inherently better suited to combatting and preventing environmental degradation. Secondly, incentive-based measures are more cost effective, both to the regulated industry and the state.[84] They provide for a cost-effective allocation of the pollution control burden among sources without requiring the state to have this information.[85] They also relieve the regulatory burden on the state, since its role is reduce to a monitor, rather than an admissions body hosting individual emissions levels,[86] and thereby avoiding the problems caused by capacity and resource constraints.[87] In fact, certain MBIs may be used to raise revenue for the state, and therefore make money rather than cost it. Therefore this type of approach may constitute a policy innovation which is win-win for the economy and the

[82] Stewart RB "Controlling Environmental Risks Through Economic Incentives" 1987-1988 13 *Columbia Journal of Environmental Law* 158.
[83] Henderson 1994 (1) *SAJELP* 51.
[84] Kidd 2002 *SAJELP* 28; Bregert et al "Providing Economic Incentives in Environmental Regulaiton" 1991 8 *Yale Journal on Regulation* 468-469. According to Bregert et al, the basic case for economic incentives is less cost, and the cost savings in a system based on economic incentives "can run anywhere from 20 to 30 percent to as much as 50 percent or more. Given that the amount that society is actually willing to spend for environmental protection is limited, that means that we can get more environmental protection for the same amount of money by using economic incentives."
[85] Stavins "Experience with Market-Based Environmental Policy Instruments" in *Handbook of Environmental Economics* 459.
[86] Kidd 2002 *SAJELP* 28.
[87] Paterson "An Incentive-Based Approach to Environmental Regulation" in *Environmental Compliance and Enforcement* 307.

environment – it leads to a reduction of regulatory cost without increasing the risk of environmental degradation through pollution or resource over-use.[88]

Thirdly, in contrast to the rigid controls put in place under the traditional approach, MBIs encourage flexibility in control technology, allowing individual firms to devise control methods which are most appropriate, effective and cost-saving.[89] This in turn leads to the fourth advantage – the incentive for firms to devise new products or production technologies which are 'greener', more efficient, and overall will save them money.[90] Another aspect of this advantage is that there is an economic self-interest to go above and beyond the required level, and this may result in more efficient resource use and improved environmental outcomes.[91] Fifthly, by using the price mechanism to build externalities into the amount consumers pay, the impact shifts towards demand-management rather than only focusing on the supply side. This is increasingly important in the context of rapidly dwindling natural resources, especially non-renewable ones such as those in the mining context.

Finally, the incentive based tools attempt to cure the market failure.[92] The knock-on effect of this internalisation of the environmental cost into the price of commodities is manifold. Furthermore, with those MBIs which raise revenue, the double dividends theory would apply, decreasing the negative effects on low-income households.[93] This theory, used in the context of environmental taxes, posits that the tax would diminish pollution at no cost, or even lead to additional benefits, if the revenue was used to reduce distortionary taxes such as tax on labour. This second dividend would then theoretically manifest either as an increase in welfare or GDP, or a decrease in

[88] Dolšak & Sampson 2011 *Admin & Society* 8.
[89] Stewart 1987-1988 *CJEL* 160.
[90] Stavins "Experience with Market-Based Environmental Policy Instruments" in *Handbook on Environmental Economics* 360; Hahn & Stavins "Economic Incentives for Environmental Protection: Integrating Theory and Practice" 1992 82(2) *The American Economic Review* 463-464. According to Hahn and Stavins, well-designed market-based approaches provide an incentive for firms to equate abatement costs at the margins, thereby achieving a given level of environmental quality at the least cost.
[91] Paterson *op cit* note 36 at 91.
[92] Kidd *Environmental Law* 221.
[93] Van Heerden *et al* "Threats and Opportunities for Post-Closure Development of Dolomitic Gold Mining Areas" 2006 36(1) *Suid-Afrikaanse Tydskrif vir Ekonomiese en Bestuurswetenskappe* 537-538.

unemployment.[94] However, the setting of the tax rate, or of any other rate at which an MBI builds an externality into a price, must be random, and therefore may not accurately cure the market failure.[95] This is because where the true externalised cost is accurately reflected in the tax or other MBI, this may adversely impact on economic behaviour so drastically that it creates hostility and negatively impacts on the economy.[96] Therefore, although incentive based tools may go a long way to curing market failure, the full environmental cost may still go unpaid by users.

2.3 Choosing the Right Market-Based Instrument

In choosing the right instrument to fit the context several of criteria have been identified by both academics and the South African government as key in deciding which MBIs should be selected. In the policy document *A Framework for Considering Market-Based Instruments to Support Environmental Fiscal Reform in South Africa*[97], the National Treasury outlined the criteria it would use to assess the suitability of the environmentally-related taxes proposed in the document. These echo the sentiments expressed by commentators, and set out eight broad criteria to be used in addition to the general principle by government in future to determine the appropriateness of environmentally-related tax instruments. Although these guidelines are very broadly framed, they will be used as a springboard from which to assess the suitability of MBIs suggested for introduction into the South African mining regulatory context, and will be tied in with comments by academics.[98]

[94] *Ibid*.
[95] Henderson 1995 (2) *SAJELP* 155.
[96] *Ibid*.
[97] National Treasury 2006 *Draft Policy Paper* 56.
[98] The evaluation by Paterson "An Incentive-Based Approach to Environmental Regulation" in *Environmental Compliance and Enforcement* is particularly helpful, as he elaborates on the requirements in his commentary on the policy paper. *Cf* Henderson 1995(1) *SAJELP*; Henderson 1995 (2) *SAJELP*.

The criteria[99] are environmental effectiveness,[100] technical and administrative issues,[101] legislative aspects,[102] policy, legal and institutional alignment,[103] and public support.[104] In addition, in the context of MBIs, several other issues stand to be considered, such as revenue aspects,[105] distributional impacts,[106] and economic competitiveness impacts.[107] Where tax instruments are used, they should be tested against the generally accepted canons of taxation principles, such as neutrality, equity, certainty, simplicity and cost minimisation.[108][109]

[99] For a discussion on the various criteria see Paterson "An Incentive-Based Approach to Environmental Regulation" in *Environmental Compliance and Enforcement* 329.

[100] The criteria of environmental effectiveness entails ensuring that there is a direct link between the instrument and the environmental objective which it seeks to achieve. The avoidance of perverse incentives would fall within this criteria.

[101] Technical and administrative issues speak to the design and integration of the MBIs into existing legislative frameworks. This should be done as seamlessly as possible, and care should be taken to avoid fragmentation, over-complication and increased costs to both the administrator and the subjects of the MBIs.

[102] A coherent legislative framework must be ensured in order to the introduction of achieve successful MBIs. Legislative amendments and promulgation of new regulations must tie in to the existing framework and create a cohesive overall approach.

[103] New MBIs should be aligned with broader policy, legislative and institutional frameworks, and should take cognisance of parallel goals such as socio-economic upliftment and national goals such as economic growth, job creation and poverty alleviation. However, in line with the principle of sustainable development, environmental conservation cannot be viewed as secondary to these other, sometimes competing, goals, and a balance must be struck in order to achieve all of the desired outcomes. Moreover, the MBIs themselves must complement the existing (and future) command-and-control mechanisms, since they rely on this system to function efficiently in order to be successful.

[104] Public support is required for the success of almost all new regulatory approaches, in order for them to gain legitimacy, and incentive-based instruments are especially dependent on public support, given the difficulty of enforcing some of them. This can be achieved through ensuring that the instruments are clear, simple and easy to use and that the public are informed of the rationale and workings behind the instrument.

[105] Tax revenue is a key consideration, given that this tool is put forward both as a means to an end and as a way of raising the revenue required to fund other MBIs. The determination of the level of taxation is a key design criterion, and care must be taken in imposing a tax that it does not have undesired consequences such as affecting the economy negatively. Further, the use and distribution of the tax revenue must also be carefully considered.

[106] Distributional impacts may be exaggerated in South Africa due to its inequalities and the large number of unemployed people. Considerations of environmental justice and proportional distribution of impacts are key, and certain means of offsetting the burden on poor households can be built into the instruments' designs.

[107] Although the era of cheap mining is over, instruments designed to protect the environment cannot undermine the viability of local industry, and this must be kept in mind when designing the MBI. However, given that there seems to be a world-wide shift in the approach to mining, South Africa will not be the first, nor the only, state to begin to build the environmental cost of mining into the price of commodities.

[108] Henderson 1995 (1) *SAJELP* 61; Paterson "An Incentive-Based Approach to Environmental Regulation" in *Environmental Compliance and Enforcement* 329.

In choosing incentive-based tools to introduce into the existing regulatory system, the context must be carefully considered, since some environmental problems are not better managed through incentives. Some problems are so complex that no package of incentives can be suggested that might achieve efficient control of the problem,[110] while others are inherently better dealt with through traditional regulation, such as localised "threshold" effects which cause serious damage on where pollution exceeds a given concentration in a particular location.[111] This is because, by their nature, MBIs lead to reduced regulatory control over individual polluters, as well as the spatial distribution of pollution;[112] they are designed to induce an aggregate reduction in pollution or risk without ensuring particular level of control at any given facility or location,[113] since how the pollution is allocated up to the objective standard is determined by the market rather than regulation. Selecting the appropriate form of intervention is therefore a difficult task, and combinations of different MBIs, or hybrid systems of command-and-control regulations combined with incentive-based tools, may be required.[114] Therefore, before implementation, incentive-based tools would need to be subjected to a formal method of instrument choice, and debated within the context of government policy and the realistic context of the environmental problem which needs to be solved.[115]

[109] The nature of these criteria are discussed in detail in Chapter 5, where they are used to evaluate the suitability of the proposed changes to existing MBIs used in the mining context, or introduction of new tools.
[110] Kolstad *Environmental Economics* 236.
[111] Stewart 1987-1988 *CJEL* 161.
[112] Dolšak & Sampson 2011 *Admin & Society* 2.
[113] Stewart 1987-1988 *CJEL* 161.
[114] Paterson 2006 *PELJ* 95-96.
[115] Henderson 1995 (2) *SAJELP* 152.

Chapter 3: Regulatory context – legislation governing mining rehabilitation and environmental protection in South Africa

Although mining is one of the main elements in South Africa's economy, and poses serious and inevitable risks to the environment, it is not overly regulated in the context of environmental protection. Currently little incentive exists further than public relations for mines in South Africa to go beyond loosely defined regulatory levels of rehabilitation. Despite the right to environmental protection being enshrined in the Constitution,[116] and the fact that this country has some of the most advanced environmental protection laws, mining falls outside of many of the statutes enacted to prevent environmental degradation.[117] The consequences are now threatening not only the environment, but the health and well-being of people in and around mines and the economy that the industry once championed. Despite certain set-backs to achieving more streamlined environmental management in the mining context, several MBIs are currently in place under a number of different statutes, and the environment has become a priority in more recent legislation governing this industry. Although there are a number of relevant laws relating to MBIs in the environmental context,[118] those relating to mining will be focused on and put into the broader context of mining and environmental regulation.[119]

[116] Section 24 of the Constitution of the Republic of South Africa, 1996.

[117] Environmental authorisations required to mine are currently being administered under the MPRDA, rather than NEMA. This legislative framework is discussed in more detail below at 3.1 and 3.2. The relationship between the MPRDA and NEMA is currently the subject of a case before the Constitutional Court, following the Supreme Court of Appeals' decision to decline a request to provide guidance on this issue in *Maccsand v City of Cape Town* (709/10; 746/10) [2011] ZASCA 141 (23 September 2011).

[118] See above, fn 36.

[119] Given the narrow focus of this dissertation on MBIs used in the mining context to control and prevent environmental degradation, the focus is kept to the MPRDA, NEMA, the National Water Act 36 of 1998 (NWA) and the Income Tax Act 58 of 1967. Because of the exclusion of mining from the broader environmental regulation under NEMA (despite the attempts to bring mining under the governance of NEMA discussed below), the discussion is divided into two parts – an discussion of mining legislation and how it regulates environmental degradation in the mining context, and a discussion of how mining fits into the broader context of environmental legislation under NEMA, and the NWA.

3.1 South African Mining Legislation

Mining in South Africa is regulated by the Mineral and Petroleum Resources Development Act (MPRDA),[120] which came into force in 2002. This Act repealed among others the Minerals Act,[121] which itself had consolidated virtually all previous mining legislation in force.[122] The MPRDA is also the most important piece of legislation regulating the effect mining has on the environment, since it currently regulates all the authorisations required for mining, including environmental authorisations, and contains provisions relating to the protection of the environment during the mining process and the rehabilitation of the areas affected by such operations once they have ceased.

The MPRDA contains numerous environmental provisions, and is more stringent that the preceding Minerals Act. This is true not only of the processes it lays out which govern the application for, granting of, and compliance monitoring, of mining authorisations in relation to environmental protection, but also the on-going and post-closure rehabilitation of mines. Under the Minerals Act, in April 1991, the mining industry was first introduced to the concept of an environmental management programme (EMP) for prospecting and mining operations.[123] However, although the legislation required mines to submit an EMP[124] indicating the manner in which it intended to rehabilitate the disturbed surfaces, and addressing the environmental impacts of the mining during all its phases (therefore including a mine closure plan),

[120] Mineral and Petroleum Resources Development Act 28 of 2002.
[121] Minerals Act 50 of 1991.
[122] Kidd *Environmental Law* 186-187.
[123] Wells et al "Terrestrial Minerals" in Strydom & King (eds) *Environmental Management in South Africa* 2009 517.
[124] Section 38 of the Minerals Act 50 of 1991 requires the rehabilitation of the surface of any prospecting or mining area in accordance with the environmental management programme which had been approved in terms of section 39; it further states that such rehabilitation should be carried out simultaneously with mining operations, and should be to the satisfaction of the Director: Mineral Development. Section 39 of the Act merely requires an environmental management programme to be submitted to the Director: Mineral Development for approval, and states that no mining or prospecting may take place before such approval is received. Section 39(5)(a) allows the Director-General to request that an environmental impact assessment be carried out prior to the approval of the EMP, but this is not mandatory.

the details of the contents of the EMP was not spelled out in the statute.[125] The details of what these documents should contain were addressed in a guideline document on EMPs created by the Department of Minerals and Energy (now the Department of Mineral Resources), together with stakeholders.[126]

A forerunner of the environmental liability clause contained in the MPRDA was section 12 of the Minerals Act, which provided for on-going liability until the issue of a closure certificate by the Director: Mineral Development. Before such certificate could be issued, the Director had to be satisfied that all of the provisions of the Minerals Act had been complied with, and had to consult with the Chief Inspector of Mines to confirm that the provisions of the Mine Health and Safety Act[127] had been fulfilled. A closure certificate could only be issued once the mine had been rehabilitated in accordance with the EMP, under section 38. However, since the exact contents of such an EMP were not mandated, and environmental impact assessments (EIAs) were discretionary, 'rehabilitation' had no fixed meaning,[128] and did not necessarily meet the standards required to return the land to a functional ecosystem, or even make it capable of future land use.

The lack of statutorily prescribed standards was remedied with the introduction of the MPRDA in 2002, and later its Regulations.[129] This new Act is more stringent than the Minerals Act, and the preamble affirms the State's obligations to protect the

[125] Dixon 2003 *JSAIMM* 483. The contents of the closure plan were also not spelled out in the statute.
[126] Dixon 2003 *JSAIMM* 100 at 483. This guideline required a baseline position to be established through an environmental impact assessment (EIA), which had to include reference to socio-economic structures, information around population dynamics, major economic activities, employment statistics and sources of employment, and information on the power supply for the area. According to the guideline, the applicant had to identify known bodies representing interested and affected parties, and the closure plan had to cover socio-economic and environmental aspects of the mine's closure.
[127] Mine Health and Safety Act 29 of 1996.
[128] Section 1 of the Minerals Act 50 of 1991 simply defined 'rehabilitation' as "…in relation to the surface of land and the environment, the execution by the holder of a prospecting permit or mining authorization of the environmental management programme referred to in section 39 to the satisfaction of the Director: Mineral Development". Since the contents of the EMP was not legislated, the level of 'rehabilitation' was left to the discretion of the Director: Mineral Development, who also had to approve the EMP.
[129] Mineral and Petroleum Resources Development Regulations GN R527 in *GG* 26275 of 23 April 2004.

environment for the benefit of present and future generations.[130] In line with this new emphasis on environmental protection, a key feature of the MPRDA is the formal construction of guidelines relating to environmental management programmes and environmental management plans (EMPs).[131]

The legislated procedure around mining and mine closure is complex, and involves various steps by both the applicant and the state. Before a right to prospect or mine is granted, the applicant must submit an environmental management plan or environmental management programme (EMP) respectively.[132] The information and studies which must be contained in these EMP[133] are prescribed, and an EIA is required for all mining rights.[134] The contents of the EMP, the scoping report and the EIA report are specified in the MPRDA Regulations,[135] and these reports, if effectively implemented, form the basis of successful environmental management in the mining industry.[136]

An important element of the EMP is the financial provision, contained in section 41 of the Act, supplemented by Regulations 53 and 54. This tool is a market-based instrument (MBI) which is built into the statute and provides a guarantee to protect the state against the risk of inheriting the responsibility to rehabilitate mines.[137] Both the EMP and the quantum of the financial provision must be reviewed annually, and any changes must be approved by the Minister of Mineral Resources.[138]

The responsibility of those involved in reconnaissance, prospecting and mining to prevent environmental degradation and to remedy any environmental damage they

[130] Kidd *Environmental Law* 187.
[131] Wells et al "Terrestrial Minerals" in *Environmental Management in SA* 517.
[132] Section 39(1) and (2) of the MPRDA.
[133] Section 39(3) of the MPRDA. Section 39(5) also empowers the Minister to call for additional information from the applicant, and to require the EMP to be adjusted.
[134] Section 39(1) of the MPRDA.
[135] Mineral and Petroleum Resources Development Regulations *op cit* note 22. The relevant regulations are 49, 50, 51 and 52.
[136] Wells et al "Terrestrial Minerals" in *Environmental Management in SA* 517.
[137] Dixon 2003 *JSAIMM* 484.
[138] Section 41(3) of the MPRDA.

may cause is also increased under the MPRDA,[139] and directors are jointly and severally liable for any unacceptable negative impact on the environment, including damage, degradation or pollution advertently or inadvertently caused by the company.[140] Although three main statutes governing environmental responsibility for damage caused by mining – the MPRDA, NEMA and the National Water Act – do not allow liability to be contracted out, the MPRDA does allow environmental liability to be transferred to a suitably qualified third party.[141] While it a potential weakness that liability can be transferred away from the party who caused the environmental damage, these provisions are not the same as the contracting out of responsibility.[142]

The MPRDA obligates the holder of a permit or right to give effect to the general objectives of the environmental management principles contained in Chapter 5 of NEMA, to consider, investigate, assess and communicate the impact of their prospecting or mining activities as contemplated in section 24(7) of the NEMA, and to manage all environmental impacts in line with their EMP and as an integral part of their operations.[143] As far as is reasonably practicable, such person must also rehabilitate the environment affected by their mining or prospecting activities to its natural or predetermined state, or to a land use which conforms to the generally accepted principles of sustainable development.[144] Liability for any damage, pollution or ecological degradation which occurs as a result of their actions attaches to the permit

[139] Section 38 of the MPRDA obligates anyone involved in mining to give effect to the general objectives of integrated environmental management laid down in Chapter 5 of NEMA, and creates a responsibility for the management of all environmental impacts in accordance with the EMP as an integral part of the operation. The responsibility for environmental damage, pollution and ecological degradation applies to the areas both inside and outside the boundaries of the area to which the mining or prospecting right applies, according to section 38(1)(e), and therefore creates a legal responsibility for acid mine drainage caused by a mine, which may affect a large area outside of the mine area. The potential effects of this extended responsibility was demonstrated in relation to pollution (although it was under the National Water Act 36 of 1998) in the case of *Harmony Gold Mining Co Ltd v Regional Director: Free State, Department of Water Affairs and Forestry* [2006] SCA 65 (RSA), in which Harmony Gold was held to be liable for pumping costs on another mine's land, in order to prevent the pollution of water from taking place in its mine.

[140] Section 38(2) of the MPRDA. The section applies notwithstanding the Companies Act 61 of 1973, and also applies to members of a close corporation, notwithstanding the Close Corporation Act 69 of 1984.

[141] Section 43(2) of the MPRDA and Regulations 58 and 59 of GN R527.

[142] Van Eeden et al *SATEB* 59.

[143] Section 38(1)(a)-(c) of the MPRDA.

[144] Section 38(1)(d) of the MPRDA.

or right holder, within and outside of the area to which the permit or right relates,[145] and director liability is created to pierce the corporate veil notwithstanding the statutes to the contrary.[146] This environmental liability persists until a closure certificate is issued.[147]

Furthermore, where any reconnaissance, prospecting, mining or production operations cause ecological degradation, pollution or environmental damage which may be harmful to the health or well-being of anyone, and which requires urgent remedial measures, the Minister may direct the holder to investigate, evaluate, assess and report on the impact of the situation, to take such measures as directed, and to complete such measures in a specified period of time.[148] If the holder fails to comply with such a directive, the Minister may act[149] after affording the holder to make representations,[150] and may apply *ex parte* to a High Court for an order to seize and sell the holder's property to the extent necessary to cover the expenses of implementing the measures deemed necessary.[151] In addition to this court application, the Minister may use funds appropriated for the purpose by Parliament in order to fully implement these measures.[152] The amount equal to the funds necessary to fully implement the measures may thereafter be recovered from the holder concerned.[153]

Both the MPRDA and NEMA compel mining companies to rehabilitate land on which mining activities have ceased. All elements surrounding the closure of mines are governed by section 43, which dramatically increases the level of required environmental rehabilitation and requires the participation of stakeholders, including other governmental departments. As under the Minerals Act, a closure certificate will only be issued once rehabilitation has been carried out in compliance with the

[145] Section 38(1)(e) of the MPRDA.
[146] Section 38(2) of the MPRDA.
[147] Section 43(1) of the MPRDA. See 3.1 above.
[148] Section 45(1) of the MPRDA.
[149] Section 45(2)(a) of the MPRDA.
[150] Section 45(2)(b) of the MPRDA.
[151] Section 45(2)(c) of the MPRDA.
[152] Section 45(2)(d) of the MRPDA.
[153] Section 45(2)(e) of the MPRDA.

approved EMP, releasing the right holder from financial and legal responsibility for the minded-out land.[154] The application for the closure certificate must be made to the Regional Manager, and must be accompanied by an environmental management risk report.[155] Once written confirmation is received from the Chief Inspector and the Department of Water Affairs regarding the provisions pertaining to health and safety and the management of potential pollution to water resources, the Minister may issue the closure certificate.[156] The Minister must then return what they deem to be an appropriate portion of the financial provision provided by the applicant, retaining any portion which they think necessary to cover latent or residual environmental impacts which may become known in the future.[157] The level of rehabilitation required is much more objective under the MPRDA, and the fact that a portion of the financial provision may be retained and closure certificate not granted if the level of rehabilitation is not satisfactory provides a financial incentive to mining companies to rehabilitate to a high standard and to do so continuously throughout the mine's life span.

Another piece of legislation which must briefly be mentioned in the context of mining is the Mineral and Petroleum Royalties Act,[158] which has been in operation since the 1 May 2010. This Act imposes a royalty on any mineral resource recovered from within the Republic of South Africa, to be paid into the National Revenue Fund.[159] The intention of the Act is to compensate the State, as custodianship over the country's non-renewable mineral resources, when these are exploited by mining companies for their own private benefit.[160] Although mining royalties have caused controversy worldwide, including in South Africa, this kind of tax is one way of compensating future generations for the loss of a non-renewable resource used up by the present

[154] Section 43(1). *Cf* Pauw *Monitoring Ecological Rehabilitation on a Costal Mineral Sands Mine* 9.
[155] Section 43(3) of the MPRDA.
[156] Section 43(5) of the MPRDA.
[157] Section 43(6) of the MPRDA.
[158] Mineral and Petroleum Royalties Act 28 of 2008.
[159] Section 2 of the Mineral and Petroleum Royalties Act 28 of 2008.
[160] Cawood "The New SA Mineral and Petroleum Resource Royalty Act: Getting to Grips with Royalty Tax" 2010 3(4) *Inside Mining* 24.

generation.[161] According to the MPRDA, the mineral and petroleum resources in which our country is rich are the heritage of the people of South Africa,[162] and it is therefore fitting that the state, as custodian, should levy a fee or consideration payable in respect of these resources.[163] Although the regime has now come into effect, its potential effects on the mining industry and economy have been viewed sceptically by stakeholders, and the potential effects are evidenced by the fact that its implementation was delayed for ten months in order to assist the mining industry in surviving the global economic crisis and prevent job losses in 2009.[164]

Although this legislation does not currently have any environmental slant, it is suggested that some or all of the revenue generated by this tax could be used in an environmental context. This idea is discussed in Chapter 5, especially in relation to a potential source of revenue for a statutory fund set up to provide money to rehabilitate ownerless and abandoned mines and to assist in the perpetual pumping and treatment of water polluted by old and current mines.

3.2 South African Environmental Legislation of Key Relevance to Mining

Although the state has historically turned a blind eye to much of the environmental damage caused by the mining industry in order to ensure economic growth, this stance is no longer viable, either politically or environmentally, and policy and legislation have changed dramatically over the past two decades. The introduction of the National Environmental Management Act (NEMA)[165] in 1998 carried out the state's Constitutional mandate to take reasonable legislative and other measures to prevent

[161] *Cf* Henderson 1994 (1) *SAJELP* 50; Henderson 1995 (2) *SAJELP* 157. Henderson suggested that a severance tax be imposed on the exploitation of non-renewable resources in order to slow the utilisation of such resources in the interests of future generations, and posited that a fund should be built up out of the proceeds to compensate them for such loss. However, the current mineral royalties tax goes into the general fiscus, and therefore would not benefit future generations directly, besides the upgrading of facilities and the general improvement of living conditions in the country.
[162] Section 3(1) of the MPRDA.
[163] Van der Zwan & Nel "The Impact of the Mineral and Petroleum Resources Royalty Act on the SA Mining Industry" 2010 18(2) *Meditari Accountancy Research* 89-90.
[164] Van der Zwan & Nel 2010 *Meditari Accountancy Research* 90.
[165] National Environmental Management Act 107 of 1998.

pollution and ecological degradation and to secure ecologically sustainable development and use of natural resources.[166] This framework statute governs environmental management broadly, and the solid foundation of environmental protection which it creates has been built on by a number of sectoral environmental laws. Those most relevant to mining are discussed here, namely those concerning water pollution and environmental impact assessment.[167]

3.2.1 Mining Regulation and the National Environmental Management Act

Environmental management in relation to specific mining activities is governed by the MPRDA, despite the legislature's attempt in 2008[168] to bring mining within the purview of the framework legislation governing the environment.[169] The legislature attempted to create a fully integrated model under which the Minister of Environmental Affairs would be the only competent authority in regards to environmental authorisations relating to prospecting, mining, exploration, production and related activities.[170] The amended statutes would have amalgamated the separate processes governing environmental authorisations, under NEMA and the MPRDA.[171] However, this process has been halted by a failure of the Minister of Mineral Resources to activate a key

[166] Section 24 of the Constitution of the Republic of South Africa, 1996.
[167] Kidd "Environmental Conservation" *LAWSA* 9 para 449.
[168] National Environmental Management Amendment Act 62 of 2008. This Act sought *inter alia* to bring the environmental management provisions in the context of mining, contained in the Mineral and Petroleum Resources Development Act 28 of 2002 (MPRDA) under the requirements for environmental authorisation in terms of the National Environmental Management Act 107 of 1998 (NEMA). Currently, mines do not require environmental authorisation under this framework legislation for actual mining activities, but have to comply with less stringent provisions under the MPRDA. The amendments would have required mines to complete full EIAs under NEMA, to be authorised by the Minister of Mineral Resources, and provisions relating to financial provisions and closure certificates, as well as environmental liability, would have been incorporated into NEMA.
[169] National Environmental Management Act 107 of 1998 (NEMA).
[170] Humby T "The Black Sheep Come Home – Incorporating Mining into the Environmental Impact Assessment Regime under the National Environmental Management Act, 1998" 2009 24(1) *SA Public Law* 1-32 at 31.
[171] Many of the changes to the MPRDA and NEMA were more cosmetic than substantial, simply moving processes from the MPRDA to NEMA. Initially, the competent authority in the mining context would remain the Minister of Mineral Resources. However, section 13 of the National Environmental Management Amendment Act 62 of 2008 provided for a re-amendment of NEMA 18 months after the date on which the initial MPRDA and NEMA amendments regarding mining came into force. This re-amendment moved all powers to grant environmental authorisation in the mining context back to the Minister of Environmental Affairs, creating a full integrated model. *Cf* Humby 2009 *SAPL* 29-31.

statute,[172] which would have transferred all of the environmental management provisions from the MPRDA to NEMA,[173] and the likelihood of this happening now seems slim.

The opportunity to bring the environmental authorisations in the mining context under NEMA would also have allowed a more uniform and stringent EIA regime to be applied in mining,[174] and would also have brought the compliance and enforcement provisions under NEMA into play.[175] Further, the strengthening of the sanctions relating to the EMP under the MPRDA, contained in the National Environmental Management Amendment Act (NEMAA),[176] has not been implemented.[177] Two statutory offences are created by the MPRDA; the first is the failure to manage all environmental impacts in accordance with the approved EMP,[178] and the second is the submission of inaccurate,

[172] Section 14(2) of the National Environmental Management Amendment Act 62 of 2008 states that, notwithstanding the subsection which declares that the Act comes into effect on a date determined by the President, the provisions relating to prospecting, mining, exploration and production and related activities come into operation only on a date 18 months after the date of the commencement of either section 2, or the Mineral and Petroleum Resources Development Amendment Act, 2008, whichever date is later. However, the Minister of Mineral Resources failed to enact the Mineral and Petroleum Resources Development Amendment Act 49 of 2008, citing concerns raised by stakeholders as a reasons to delay enactment and further consult with the industry. Given this stance, expressed in a written reply to a question in Parliament on 5 March 2010, it seems unlikely that the environmental provisions currently under the MPRDA will be relocated to NEMA in the near future.

[173] For a comprehensive overview of the amendments to both NEMA and the MPRDA, as well as the development of the environmental impact assessment in the mining context, see Humby 2009 *SPL* 1-32.

[174] Humby 2009 *SAPL* 22.

[175] Since the MPRDA is not a specific environmental management Act (SEMA), the compliance and enforcement provisions under NEMA are not applicable when the MPRDA is breached. Section 1 of NEMA defines a SEMA as 'an Act of Parliament that regulates a specific aspect of the environment, as defined in this Act, and includes any regulations or other subordinate legislation made in terms of such an Act'. The benefits of SEMAs is that they can be enforced by Environmental Management Inspectors (EMIs) who sit across a variety of Departments and spheres of government, and who have powers exceeding those under the MPRDA. Although the MPRDA affords authorised person a range of compliance and enforcement powers in relation to the offences under that Act, such as routine inspection powers under section 92, investigation powers under section 91, and the power to issue orders to persons suspected of non-compliance, contained in section 93, the crucial power to arrest those contravening the Act is not conferred. This is a shortfalling which could be remedied if the MPRDA was brought under the scope of NEMA, as the EMIs have the power to arrest. Furthermore, lack of sufficient monitoring and enforcing compliance could also be overcome. *Cf* Craigie F, Snijman P & Fourie M "Environmental Compliance and Enforcement" in *Environmental Compliance and Enforcement in South Africa*.

[176] National Environmental Management Amendment Act 62 of 2008. The relevant section in NEMA is section 24F(4).

[177] Humby 2009 *SAPL* 27-28.

[178] Section 98(a)(iii) read with section 38(1)(c) of the MPRDA.

incorrect or misleading information connected with any matter.[179] The sanction attached to the first is R500 000 or imprisonment of up to ten years, or both,[180] while the sanction attaching to the second is a fine or imprisonment of up to six months, or both such fine and imprisonment.[181] If the amendments had come into force, these sanctions would have increased dramatically to a fine not exceeding R5 million, or a sentence of up to ten years, or both such fine and imprisonment.[182] Should the changes introduced by the Legislature not be implemented, an opportunity will be lost to streamline and strengthen environmental regulation in the mining sector, and to increase the industry's compliance with environmental protection laws.

However, as shown above, the MPRDA created a sea-change in the South African mineral law, bringing in a clear environmental agenda into the legislation.[183] This new focus on environmental protection can be seen in the manner in which the mining statute ties in with the framework legislation governing the environment. The national environmental management principles in NEMA[184] apply to all prospecting and mining operations, and serve as guidelines for the interpretation, administration and implementation of all of the environmental requirements of the MPRDA.[185] One of these principles is that of sustainable development, which forms an integral part of the MPRDA,[186] addressing both the socio-economic[187] and environmental influence of

[179] Section 98(b) of the MPRDA.
[180] Section 99(1)(c) of the MPRDA.
[181] Section 99(1)(g) of the MPRDA.
[182] Section 24F(4) of NEMA.
[183] Sorensen *op cit* note 2 at 626.
[184] National Environmental Management Act 107 of 1998.
[185] Section 37 of the Mineral and Petroleum Resources Development Act 28 of 2002; Kidd *Environmental Law* 187.
[186] The principle of sustainable development is contained in the long title of the MPRDA, and features throughout the Act, including the preamble's commitment to ecologically sustainable development, the obligation placed on the Minister of Mineral Resources to ensure the sustainable development of the nation's mineral resources within the framework of national environmental policy in section 3(3), to the obligation placed on anyone involved in the mining process to conform with the generally accepted principle of sustainable development through rehabilitating the mining area to its natural or predetermined state, contained in section 38(1)(d). This principle must also be taken into consideration by the Minister before they authorise any kind of mining-related activities, and forms an integral part of their power to restrict mining activities in certain areas (contained in section 49(1)).
[187] Before any mining activities may take place, a mine must have a workable Social and Labour Plan in place, according to section 23(1)(e) of the MPRDA.

mining.[188] Although mining cannot be sustainable in the true sense, since mineral deposits are finite, the environmental degradation can be mitigated, and land rehabilitated to a certain degree in order to ensure the possibility of future land use and re-establishment of ecosystems which previously existed.

Although mining itself is not strictly governed by NEMA, the general duty of care contained in this Act does apply, and environmental authorisations are still required for listed activities which arise around the mining operations.[189] The general duty of care contained in section 28 of NEMA applies to every person who causes, has caused or may cause significant pollution or degradation of the environment, and obligates such person to take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or in so far as such harm to the environment is authorised by law or cannot be reasonably be avoided, that it be minimised and rectified.[190] Therefore, even where mining is authorised by law and environmental harm is allowed for in an EMP and mining authorisation, environmental harm and pollution must be minimised and rectified independently of the MPRDA. A duty also exists to inform and educate employees about the environmental risks of any activity undertaken and manner in which they must perform their tasks in order to avoid causing significant pollution or degradation.[191] Importantly in the context of water pollution in mining, section 28(3)(d) states that measures required in terms of the duty of care may include measures to contain or prevent the movement of pollutants or the causant of degradation.[192] This provides another basis on which mining companies are obligated to act in the interests of preventing future pollution, regardless of the terms of their EMP and of when their mining right was granted (since the NEMA is patently retrospective[193]). Furthermore, any unlawful and intentional or negligent act or

[188] Wells et al "Terrestrial Minerals" in *Environmental Management in SA* 514.
[189] Connected activities include the building of roads, certain clearing of vegetation, etc. EIAs would have to be carried out in accordance with section 24 of NEMA in order to attain these environmental authorisations, and the procedures contained in the Environmental Impact Assessment Regulations GN R543 in *GG* 33306 of 18 June 2010 would have to be followed.
[190] Section 28(1) of the NEMA.
[191] Section 28(3)(b) of the NEMA.
[192] Section 28(3)(d) of the NEMA.
[193] Section 28(1A) of the NEMA.

omission which causes or is likely to cause significant pollution or environmental degradation is an offence, as is refusal to comply with a directive issued under section 28.[194] An act or omission which is unlawful and intentional or negligent, and which detrimentally affects or is likely to affect the environment in a significant manner is similarly an offence.[195]

Section 30 of NEMA is also relevant to mining, and imposes a duty on responsible parties in relation to emergency incidents. It authorises the municipality involved, the provincial heads of department or other designated officials, or the Director-General to act when the necessary steps are not taken by other parties.[196] The duty created by this section relates both to the actions which must be taken when emergency incidents occur,[197] and reporting obligations,[198] and further emphasises the responsibility of the person who caused damage to the environment to remedy the effects.[199] The relevant authority may direct the responsible person to act to fulfil their responsibilities,[200] and where it is unclear who the responsible person is, or where immediate action is required, the state may take the necessary steps to contain and minimise the effects of the incident, undertake clean-up procedures and remedy the effects of the incident.[201]

Section 30 of NEMA applies over-and-above the duties of parties under the MPRDA, and non-compliance is an offence.[202] This provision allows for a much broader scope

[194] Section 28(15) read with section 28(14)(a) and (c) of NEMA.
[195] Section 28(14)(b).
[196] Section 30(2)(a) to (c), read with section 30(1) of NEMA.
[197] Section 30(4)(a) to (d) of NEMA.
[198] Section 30(3)(a) to (d). The nature of the incident, risks posed to public health, safety and property, and the toxicity of any substances must be reported to the Director-General, the South African Police Service, the relevant provincial head of department or municipality and all persons whose health may be affected by the incident as soon as the responsible person becomes aware of it. Any steps which should be taken to avoid or minimise the effects of the incident on public health and the environment must also be reported. Section 30(5) outlines longer-term reporting obligations which must take place within 14 days of the incident, including the causes and measures to be taken to avoid a recurrence of such an incident.
[199] Section 30(4) obligates the responsible person to take all reasonable steps to contain and minimise the effects of the incident, undertake clean-up procedures, remedy the effects of the incident and assess the immediate and long-term effects of the incident on the environment and public health.
[200] Section 30(7) of NEMA.
[201] Section 30(8) of NEMA.
[202] Section 30(11) of NEMA.

for intervention, and is necessary in an industry which poses such a grave risk to the environment and to human health and safety (both of workers and those in and around areas which are mined).

3.2.2 Mining Regulation and the National Water Act

The National Water Act (NWA),[203] which pre-dates the NEMA but which ties in closely with the framework Act, and which has been included as a specific environmental management Act (SEMA) under NEMA, deals with water pollution in section 19. The prevention and remedying of the effects of pollution in this provision are far-reaching in the mining context, and have been interpreted broadly by the courts.[204] It obligates the owner, person in control of, occupier or user of land on which an activity took place or a situation exists which causes, has caused or is likely to cause pollution of a water resource, to take all reasonable measures to prevent any such pollution from occurring, continuing or recurring.[205] Failure to act in situations where a catchment management agency (or the Minister of Water Affairs, where such agency has not yet been created) directs the person responsible for preventing or remedying the situation, results in the agency being allowed to act and to recover the costs incurred. Furthermore, section 151 of the Act criminalises any intentional or negligent act or omission which pollutes or is likely to pollute a water resource,[206] as well as the failure to comply with directives issued under section 19,[207] resulting in a fine or jail sentence upon conviction. Coupled with the director liability contained in NEMA, this means that the directors of mining companies are personally liable for any pollution of water resources caused by mines,

[203] National Water Act 36 of 1998 (NWA).
[204] *Cf* the *Harmony* judgement, discussed in note 113.
[205] Section 19 of the NWA. This liability was interpreted by the courts in *Harmony* to extend to acting on another's land to prevent pollution from occurring on one's own land (in the capacity of owner, person in control, occupier or user of land).
[206] Section 151(1)(i) of the NWA. It is also an offence to unlawfully and intentionally or negligently commit any act or omission which detrimentally affects or is likely to detrimentally affect a water resource, according to section 151(1)(j) of the NWA.
[207] Section 151(1)(d) of the NWA.

including the widespread problems of acid mine drainage currently threatening large parts of the country.

As in NEMA, the NWA also contains provisions relating to emergency incidents which govern the duties of the responsible person to report and act in emergency situations.[208] These provisions are especially relevant in the mining context, considering the drastic effects that mining has on water, and the threat of water pollution caused by AMD which can decant and damage both the environment and property. The duties outlined in section 20 are very similar to those contained in NEMA, and consist of duties to act to report emergency incidents,[209] to take all reasonable steps to contain and minimise, clean up and remedy the effects of the incident,[210] and to comply with any directives issued by the catchment management agency.[211] Non-compliance with this section is also a criminal offence in terms of section 151.

The NWA is one of the only statutes other than the MPRDA to utilise financial provisions, and these are set out in Chapter 5 of the Act.[212] The responsible authority is the Department of Water Affairs, and this area falls within their mandate to manage the country's water resources. Therefore, although such mechanisms are relevant in the mining industry (and should be utilised more widely), a full discussion falls outside of the ambit of this dissertation. The underlying concepts are however outlined.

The Act sets out measures to finance the provision of water resource management services, as well as financial and economic measures to support the implementation of strategies aimed at water resource protection, conservation of water and the beneficial

[208] Section 20 of the NWA.
[209] Section 20(3) of the NWA obligates the responsible person to report the incident to the Department of Water Affairs, the policy or relevant fire department, or the relevant catchment management agency. This provision is narrower than the NEMA provision, in that the responsible person can choose which body to report the matter to, whilst under NEMA all of the named institutions must be contacted.
[210] Section 20(4) of the NWA.
[211] The Catchment Management Agency is authorised by section 20(6) to act where the responsible person fails to comply with directives, or where it is not possible to give directives timeously, and any costs may be recovered.
[212] Sections 56 to 62 of the NWA.

use of water. Water use charges form part of a pricing strategy which may differentiate geographically, and is a form of demand management, as well as a means to raise revenue to fund water resource management.[213] The Act also makes provision for a performance bond to be required as security, in order to protect the water resource, before a use licence is issued.[214] However, although this mechanism exists in the Act, it seems not to be utilised by the authorities.

3.3 Current Use of Market-Based Instruments in Relation to Mining

The South African government's move towards incorporating incentive-based tools into their regulatory regime is already present in the mining context in the form of both tax-based and non-tax based MBIs. Financial guarantees[215] are required to be set aside by mining companies before a mining or prospecting right is granted, and these performance bonds serve as guarantees against the risk of environmental rehabilitation being passed on to the state. Tax incentives exist under several statutes in relation to mining, incentivising mining companies to carry out their duties in relation to the financial provisions.[216] The non-tax incentives will be dealt with first.

3.3.1 Non-tax based incentives

Perhaps the most important MBI introduced by the government is the financial provision currently in place under the MPRDA.[217] According to this provision, an applicant for a mining or prospecting right is required to make the prescribed financial provision for the management or rehabilitation of negative environmental impacts before their EMP is approved.[218] The forms of this financial provision are given to mean insurance cover, bank guarantee, trust fund or cash, and the quantum of such

[213] Section 56 of the NWA; Department of Water Affairs 2004 1 ed *National Water Resource Strategy* 42.
[214] Section 30 of the NWA. This is discussed further in 4.1 below.
[215] See also 3.1 above.
[216] These are discussed below at 3.3.2.
[217] Section 41 of the MPRDA and Regulations 53 and 54 of the MPRD Regulations.
[218] Section 41 of the MPRDA. *Cf* Wells et al *op cit* note 106 at 554.

performance guarantees must be sufficient to undertake the agreed work programmes, as well as to rehabilitate the relevant mining area.[219] An official *Guideline Document*[220] was published by the Department of Mineral Resources in January 2005, in terms of Regulation 54(1), to assist mines in determining this quantum, and the Regulations flesh out the requirements set out in section 41.[221]

The quantum put forward by the applicant must be to the satisfaction of the Minister, who may appoint an independent assessor to conduct an assessment and determine the financial provision.[222] According to Regulation 54, the quantum must include a detailed itemisation of all costs required for the premature closing,[223] the decommissioning and final closure of the operation and the post-closure management of residual and latent environmental impacts. This quantum must be annually reassessed by the holder of a prospecting or mining right or permit, and must be kept in line with their environmental liability.[224] Should the holder of a prospecting or mining right or permit fail to rehabilitate or manage, or be unable to rehabilitate or manage any negative impacts on the environment, the Minister may, upon written notice, use all or part of the financial provision to rehabilitate or manage the negative environmental impact in question.[225] The holder's obligations to maintain and retain the financial provision remains in force until the closure certificate is issued in terms of section 43, and even then the Minister may retain a portion (or all) of the financial provision which they deem necessary to rehabilitate the closed mining or prospecting

[219] Section 41(5) of the MPRDA.
[220] Department of Minerals and Energy *Quantum Guideline Document op cit* note 25.
[221] Regulation 53 sets out the methods for financial provisions, while Regulation 54 sets out what the quantum of the financial provision is required to cover.
[222] Section 41(4) of the MPRDA.
[223] In relation to premature closing, the Regulation states that provision must be made for the rehabilitation of the surface area, the prevention and management of pollution of the atmosphere, the prevention and management of pollution of water and soil, and the prevention of leakage of water and minerals between sub-surface formations and the surface.
[224] Section 41(3) of the MPRDA. Regulation 54(2) further states that such annual review must be in consultation with a "competent" person as required in terms of the EMP or as requested by the Minister. Any inadequacies must be rectified by the holder in an amendment to the EMP, within the timeframe provided for an as determined by the Minister (Reg 54(3)).
[225] Section 41(2) of the MPRDA.

operation in respect of latent or residual environmental impacts.[226] A major short falling of the quantum provisions is that they do not specify that the *Guideline Document* should be reviewed and updated, and the first document released by the Department has also been the last. Therefore the quantum calculations remain at 2005 levels, without provision being made for inflation, and although some of the major mines have built inflation into their calculations, many others have not, leaving the possibility open that the state could have to bear the financial responsibility of rehabilitating abandoned mines where operations are closed and the companies are unable to raise enough capital to carry out the rehabilitation themselves.

The forms in which the financial provision may be made is also an area of slight confusion, since the vehicle of insurance is included in the definition of 'financial provision' in section 1 of the MPRDA, but does not appear in the list of methods contained in Regulation 53, which is repeated in the *Guideline Document*. A further oversight is the fact that the method of trust fund contribution must be in terms of an approve contribution as provided for in terms of section 10(1)(cH) of the Income Tax Act.[227] However, this section has been repealed,[228] leaving the precise meaning of this provision in question.

Despite this oversight by the authorities, the trust fund is the preferred method of financial provision, especially by the larger mining operations.[229] Because the annual contributions to a trust fund are tailored for funding the final mine closure over the life of a mine, according to a formula set out in the *Guideline Document*, a shortfall has developed in the overall liability in case of premature closure, and this shortfall was in

[226] Section 41(5) and section 45(6) of the MPRDA. The MPRDA Regulations define 'latent environmental impact' as "any environmental impact that may result from natural events or disasters after a closure certificate has been issued", and a 'residual environmental impact' as "the environmental impact remaining after a closure certificate has been issued". These definitions are not ideal, since latent environmental impacts need not be 'disasters' to pose a serious risk to the environment, health, well-being and the economy.

[227] Income Tax Act 58 of 1962.

[228] Section 10(1)(cH) of the Income Tax Act 58 of 1962 was deleted by section 21(1)(a) of the Taxation Laws Amendment Act 30 of 2000.

[229] Department of Minerals and Energy *Quantum Guideline Document op cit* note 25 at 3.

most cases not covered by any of the other methods.[230] Although this fact is acknowledged in the *Guideline Document*, the process of the financial provision being "phased in" in portions by the mining companies has developed, with separate payments being made at set periods in the mine's life rather than a lump sum being provided up front. However, upon close inspection of the wording contained in the MPRDA, this practice is not condoned by the MPRDA, and should not be allowed to continue by the authorities.[231] It also seems that the *Guideline Document* envisages the full amount required to rehabilitate the mine in the event of premature closure to be available at all times, since it describes the annual assessment of the total quantum of environmental liability to be ensure that the financial provision is sufficient to cover the current liability (in the event of premature closure) as well as the end-of-mine liability.[232] This is referred to as a "snapshot in time approach", and is used by DME Regional Office to review and approve the quantum of the financial provision and quantum for final closure of the mine.

Several weaknesses in the trust fund method have been noted, and are concerning, since the Department admits that this is the predominant method in which financial provision is made. The first weakness applies to all of the methods, and centres on the fact that no prescription is made on how the Minister should calculate the amount of the financial provision to be kept in order to cover the future costs of latent or residual

[230] *Ibid* at 3-4.

[231] Section 41(1) of the MPRDA states that the applicant must make financial provision – as defined in section 1 of the MPRDA and as read with regulation 54(1) – "before the Minister approves the environmental management plan…or programme". Since mining may not, in terms of section 5(4) of the MPRDA, commence without an approved EMP, it seems clear that the entire financial provision must be set aside before mining may take place. The annual reassessment provisions (section 41(3) and regulation 54(2)) also suggest that the entire financial provision must be set aside at the start of the operation, and reviewed thereafter. Furthermore, regulation 53(1) sets out the four methods to provide the financial provision required in terms of section 41 to achieve the "total quantum" for rehabilitation, management and remediation of negative environmental impacts. The use of the words "total quantum" in this context seems to indicate that the drafters intended the full amount to be set aside before operations commenced. Finally, regulation 53(2), which relates to the financial provision in the form of direct deposit into an account specified by the Director General, states that the proof of payment must be submitted prior to the approval of the EMP. Since the EMP is necessary for mining to commence, the lump sum of the financial provision in this form must be paid before commencement. It is highly unlikely that only one method of financial provision would require the full amount to be set aside upfront, and this must therefore also be the case with the other methods available to applicants.

[232] Department of Minerals and Energy *Quantum Guideline Document op cit* note 25 at 4.

environmental impacts, apart from the environmental risk report submitted by the holder. 'Latent environmental impact' is defined in Regulation 1 to mean "any environmental impact that may result from natural events or disasters after the closure certificate has been issued", while 'residual environmental impact' is described as "the environmental impact remaining after a closure certificate has been issued". While residual impacts can be planned for in the environmental risk report, latent impacts can clearly not be accurately forecast, and it is therefore unclear exactly how the Minister calculates how much of the financial provision to retain in order to make provision for this eventuality.

A further weakness, this time peculiar to the trust fund method of financial provision, is that the identity of the trustee of the fund. It seems unlikely that the Minister is named as trustee of every trust fund set up in compliance with section 41, but it is unclear exactly how access is gained to the funds contained in these vehicles in the event of premature closure of the mines.

One question which remains unclear is whether financial provisions are ring-fenced in the event of the rights holders being wound up upon becoming insolvent. One of the amendments to NEMA which would have been activated by the enactment of the Mineral and Resource Development Amendment Act[233] is section 24P, which deals with financial provisions for the remediation of environmental damage stemming from prospecting, mining, exploration, production or related activities on the prospecting, mining, exploration or production area. In terms of section 24P(6), the Insolvency Act[234] does not apply to any form of financial provision, or any amounts arising from such a provision. However, since this provision remains inactive, it remains unclear what the current situation is with regards to the fate of financial provisions upon insolvency.

What happens to financial provisions upon insolvency is largely determined by the nature of the method used to provide the guarantee and the way in which this is

[233] Mineral and Petroleum Resources Development Amendment Act 49 of 2008.
[234] Insolvency Act 24 of 1936.

carried out. Trust funds which are properly constituted will fall outside of the insolvent estate of a mine,[235] but whether the trust funds which are provided in financial provisions meet this criterion would have to be determined with reference to the specific instruments. Whether insurance is included in the insolvent estate depends on the details of the insurance policy.[236] As with insurance, the determinant factor of whether bank guarantees fall outside of the insolvent estate depends on the details of the agreement. It seems reasonable to assume that financial provision by means of direct deposit would fall outside of the insolvent estate.

Therefore, despite the fact that it seems most financial provisions would be safe in the event of insolvency, a lot depends on the context and the actual instrument used to make the 'payment', and more certainty is necessary to clear up misunderstandings and avoid potential risks.

A final short falling of the entire provision relating to financial provisions relates to the amount of time allocated to the carrying out of the studies required to compile the EMP, including the determination of the closure plan and the financial provision contained therein. Upon application for a mining right, an applicant must carry out an environmental impact assessment and submit an EMP within 180 days of the date on which he or she is notified by the Regional Manager to do so, according to the

[235] Item 9 of Schedule 5 of the Companies Act 71 of 2008, which governs all aspects of companies, states that the Companies Act 61 of 1973 applies to the winding-up and liquidation of companies (apart from the winding up of solvent companies). According to section 339 of the 1973 Companies Act, the law relating to insolvency is applicable to the winding-up of a company unable to pay its debts. The Insolvency Act 24 of 1936 regulates the sequestration and winding up of a debtor's estate, with all property belonging to the debtor falling into the insolvent estate upon sequestration. According to the Trust Property Control Act 57 of 1988, trust property does not form part of the personal estate of the trustee. Therefore, financial provisions in the form of properly constituted trust funds of which the mine is the trustee are excluded from the insolvent estate.

[236] Section 156 of the Insolvency Act provides that where an insurer is obliged to indemnify an insured in respect of any liability incurred by the insured towards a third party, upon sequestration, the third party is entitled to recover from the insurer the amount of the insured's liability towards the third party (for which the insured was indemnified). Assuming the Department of Mineral Resources (DMR) is the appointee third party beneficiary of a particular insurance policy, financial provisions would arguably fall into this category, and would therefore be excluded from the insolvent estate, with DMR being able to claim the insurance directly from the insurer (without having to obtain a court order or enter into an agreement with the trustee). *Cf* Sharrock "Insolvency" *LAWSA* 11, para 245.

MPRDA.[237] There are numerous elements to be built into the EMP,[238] including the determination of the financial provision, and a mine would be foolish to invest in the expensive studies required to create these reports before knowing whether or not they qualified for the right they had applied for. Therefore all of the studies and calculations, drafting and planning must take place in the period of 180 days, which seems much too short a period. This element therefore needs to be extended or somehow made more efficient and effective.

3.3.2 Tax-based incentives

On top of the incentive provided to mining companies to rehabilitate the disturbed areas and continuously prevent environmental degradation in order to claim back their financial provision upon closure of the mine, the state has incentivised the actual payment for mining rehabilitation under the Income Tax Act.[239] Any payment by a mining company to another company, association or trust established with the sole objectives of complying with the legal obligations imposed on mining operations to rehabilitated the mined surface, prevent pollution and protect land and water resources, as required by the MPRDA, is tax deductible in terms of section 37A.[240] This essentially means that the right holder's fulfilment of its obligations to pay its financial provision under section 41 of the MPRDA, if in the form of a trust, or its transfer of environmental liability to an approved third party for a fee, is tax deductible. A financial incentive is also provided for these mining rehabilitation companies and trusts to spend their resources on environmental rehabilitation (the very purpose of their existence), since if the money is spent on anything other than rehabilitation, the amount is deemed taxable in the name of the entity in terms of section 37A(7).[241]

[237] Section 39(1) of the MPRDA.
[238] Baseline information must be established, an EIA must be carried out, an environmental awareness plan bust be created, a plan regarding how the applicant intends to remedy, modify, control or stop any activity which causes pollution or environmental degradation must be formulated, and the financial provision must be created.
[239] Income Tax Act 58 of 1962.
[240] Paterson 2009 *SAJELP* 29.
[241] Paterson 2009 *SAJELP* 29.

This incentive at best seems tautologous when viewed alongside the performance bond built into the MRPDA, and at worst seems to normalise non-compliance with legal obligations by mining companies to the point where compliance with the law must be incentivised. Even worse is the fact that this tax incentive falls short of the overall environmental objective in that there remains widespread non-compliance, with a report in 2009 indicating that none of the big gold mining companies operating in the West Rand or Far West Rand operate according to an approved EMP, and that there is a widespread lack of monitoring.[242] This climate of non-compliance with statutory requirements is also evidenced by the fact that many mines are operating without the requisite water licences, with many not even having applied for them.[243]

The environmental objective behind this tool is very narrow, based on its drafting and operation. It seems to seek only to ensure that those who are obligated to spend money on mining rehabilitation by law in fact do so. The incentive therefore seems only to encourage minimum rehabilitation to achieve compliance with the existing legal requirements. If this is indeed its aim, it is in fact a negative element in that it seems to indicate that the only penalty for non-compliance with legislated obligations would be the loss of the tax incentive to do so.

The narrow objectives could be broadened by changing the focus of this tax-based incentive from bare compliance to going above and beyond the existing legal requirements under the MPRDA and individual EMPs. By creating an incentive to go beyond the required level of rehabilitation, the quality and consistency of rehabilitation in the mining sector could be increased, and a more important and positive environmental objective could be achieved. Further, by encouraging mining companies to exceed the levels of rehabilitation agreed to in their EMPs and therefore statutorily required before their performance bonds may be returned, the dominant mind-set

[242] Van Eeden et al 2009 *JTRSA* 64.
[243] van Vuuren A "State Names Water Transgressors" (22.06.2011) *Miningmx.*

shifts away from mere compliance to achieving significant rehabilitation and environmental conservation.

Chapter 4: Market-based instruments and mining in foreign jurisdictions – some options for South Africa

While South Africa is just beginning to introduce market-based instruments as tools to fill some of the gaps left by command-and-control measures in the environmental context, other jurisdictions have been experimenting with these devices for the last two decades, and several lessons may be learnt from their experiences. Some of these jurisdictions already use these tools in the mining context, while others use tools in other environmental spheres which could be adapted to fit South Africa's needs in the context of mining management. In some cases, such as performance bonds and environmental taxes, South Africa is already using these tools, but could improve their implementation. In other instances new tools are examined as possible introductions into the South African legislative framework. Five types of instruments used in foreign jurisdictions will be discussed. These are performance bonds, environmental funds, environmental tax, tax incentives and mitigation banking.

4.1 Performance Bonds

The performance bond is one of the most important weapons in the South African government's arsenal in its fight against environmental degradation caused by mining.[244] However, the implementation of this tool has several weaknesses and lessons can be learnt from other jurisdictions use of this instrument in order to improve the government's risk cover in this regard.[245] Further, although the mechanism exists to require rehabilitation funds to be established under three key South African laws,[246]

[244] See Chapter 3.
[245] See Chapter 3.
[246] Section 41 of the MPRDA requires mines to set aside a financial provision to cover the cost of rehabilitation both during and after the life of the mine. Section 30 of the National Water Act 36 of 1998 provides that a responsible authority may, "if it is necessary for the protection of the water resource or property", require the applicant for a water use licence at provide security in respect of any obligation or potential obligation arising from a licence to be issued under that Act. In terms of section 24(5)(b)(ix) of NEMA, the Minister or MEC may make regulations consistent with subsection (4) (which deals with the

they are only utilised in the mining context, and therefore "[e]xtending their current implementation in South Africa would appear to be well advised and equitable".[247]

The performance bond or guarantee (also known as the environmental bond) is a financial guarantee submitted by a firm *ex ante* to incentivise compliance with specified targets, objectives and permitting conditions.[248] These bonds originate from the material user fees, where a firm is required to post a bond covering any potential environmental damage in order to force them to internalise perceived social (or environmental) costs into their private resource allocation decisions.[249] Not only do they provide an incentive for firms to meet the targets set by the state in order to secure the return of the whole or part of the bond, but they ensure that the funds exist to indemnify the state against the future environmental costs of the firm's current activities, should they cause environmental damage, with the bond increasing in proportion to the perceived potential risk.[250] This form of MBI is a valuable tool in encouraging firms to spend money on mitigation measures and the minimisation of their environmental externalities in order to benefit financially in the long run,[251] and results in prevention of environmental degradation rather than *ex post facto* rehabilitation.

Performance bonds have been successfully used in foreign jurisdictions in the mining context to ensure that companies rehabilitate the disturbed surface and minimise

procedures for the investigation, assessment and communication of potential consequences or impacts of activities on the environment) laying down the procedure to be followed in respect of, among other things, financial provisions. Section 24(5)(d) also allows the Minister or MEC to make regulations requiring, after consultation with the Minister of Finance, the provision of financial and other security to cover the risks to the State and the environment of non-compliance with the conditions attached to environmental authorisations. However, no such regulations under NEMA have been created.

[247] Paterson 2006 *PELJ* 103.

[248] Paterson "An Incentive-Based Approach to Environmental Regulation" in *Environmental Compliance and Enforcement in South Africa* 303.

[249] Shogren et al "Limits to Environmental Bonds" 1993 *Ecological Economics* 111.

[250] Shogren 1993 *Ecological Economics* 111.

[251] Paterson 2006 *PELJ* 103. The advantage of this tool has been recognised by the National Treasury in its *2005/2006 Budget Tax Proposals* 2005 at 16.

environmental degradation throughout the life of the mine.[252] As is the case in South Africa, both the United States of America and Australia have historical legacies of abandoned mines, and these governments therefore also exhibit a heightened preparedness for mine closure, which our country has aspired to imitate.[253] The performance bond is especially suited to mining rehabilitation, since such reclamation occurs when the operation is no longer financially profitable, and the bond acts as an assurance that the money set aside for the rehabilitation will be properly spent.[254]

In the United States of America, the Surface Mining Control and Reclamation Act (SMCRA)[255] requires operators to post a bond as a condition to mine coal.[256] The quantum of the bond must be sufficient to perform the rehabilitation if it is forfeited and the regulatory authority must do the work, and the value is determined based on the "worst case method".[257] This surface mining bond ensures that the disturbed land is reclaimed, either by the operator or by a third party, and is only released after the mining and reclamation operations have been inspected by the regulatory authority.[258] However, even in this developed country the value of the bonds is often insufficient to reclaim the disturbed land fully, and additional funding must be used from supplemental state funds.[259] The country also suffers from a plethora of abandoned mines, with 17 000 in Colorado alone.[260] The SMCRA also sets up an Abandoned Mine Reclamation Fund[261] to deal with this situation.[262]

[252] Shogren et al 1993 *Ecological Economics* 111; Kramer 2008 *Colorado Journal of International Environmental Law and Policy* 315.
[253] Kramer "Reclaiming Reclamation: The Benefits and Costs of Hard Rock Mining" 2008 19(2) *Colorado Journal of International Environmental Law and Policy* 305.
[254] Kramer *CJIELP* 305-306.
[255] Surface Mining Control and Reclamation Act of 1977.
[256] Section 509(a) of the SMCRA. *Cf* Shogren et al 1993 *Ecological Economics* 120.
[257] *Ibid.*Section 509(a) of the SMCRA also sets a minimum of $10 000 for the bond for an entire area under on permit.
[258] Section 509(b) and section 519 of the SMCRA. The liability period includes the duration of the mining period and the reclamation operation, as well as a period coincident with the operator's responsibility for revegetation, which is required by section 515.
[259] Shogren et al 1993 *Ecological Economics* 121.
[260] Kramer 2008 *CJILP* 312.
[261] Section 401 of the SMCRA.
[262] This fund will be further discussed below in 4.2.

Some key differences between this system and the one used in South African mining regulation is that cost of the rehabilitation is estimated by the regulator, rather than the mining company, and surety companies may come forward to pay the bond, acting as insurance companies in the bonding of surface coal mines.[263] By doing the estimate of how much rehabilitation will cost, taking into account the worst case scenario, the state is able to better protect itself against the risk of having to cover the expense of the rehabilitation, and by allowing surety companies to post the bonds for mining companies, the state outsources some of the legwork in investigating the mining companies' financial credentials.

Western Australia also uses performance bonds in the mining context, holding these guarantees pending appropriate rehabilitation and final relinquishment of the mining lease.[264] The bonds are paid to the state mining authority, to be repaid after successful rehabilitation, creating a financial incentive to ensure that rehabilitation is carried out and providing a source of funds for remediation efforts in the event of a corporate failure of a mining venture or abandonment.[265] In 2009 the Western Australian mining industry had around $800 million worth of performance bonds held against it by the government on grounds of environmental performance.[266] However, the government conservatively estimates that this represents, on average, only 25 per cent of the total costs of rehabilitation.[267] This is due to the level of investment in the mining sector, the increase in scientific knowledge regarding environmental impacts and long-term effects of mining, and the increase in the communities' expectations of mining rehabilitation standards.[268] One of the suggestions put forward by the government of Western

[263] Section 509(b) of the SMCRA. *Cf* Shogren et al 1993 *Ecological Economics* 121. The surety companies either rehabilitate the land themselves to standards specified by the regulatory authority, or pay the bond in case the firm is found guilty of environmental degradation.
[264] Sections 84 and 84A of the Mining Act 1978.
[265] Kramer 2008 *CJIELP* 315.
[266] Australian Department of Mines and Petroleum 2010 *Policy Options for Mining Securities in Western Australia: Preliminary Discussion Paper* 1.
[267] *Ibid*.
[268] *Ibid*.

Australia to combat this situation is the establishment of a Mining Securities Fidelity Fund.[269]

A major drawback is that the Australian regulatory environment in which these performance bonds are situated does not specify water quality guidelines, leading to problems after rehabilitation has occurred.[270] In this respect South Africa is in fact ahead of Australia, since the Department of Water Affairs must approve closure plans and environmental risk management plans, under the MPRDA, before closure certificates are issued to mines, thus allowing performance bonds (in whole or in part) to be returned to the right holder. However, the actual oversight in this regard is weak, as evidenced by the existing acid mine drainage problem currently being experienced in South Africa, and the lesson to be learnt from Australia's example is that the inter-departmental co-operation between the Department of Mineral Resources and of Water Affairs is key in ensuring environmental standards and avoiding expensive future rehabilitation and treatment efforts by the state.

4.2 Environmental Funds

The ringfencing or earmarking of revenue is sometimes argued to be out of step with sound financial policy,[271] and the South African National Treasury has stated that it does not support full earmarking of revenues generated from environmental taxes.[272] However, environmental funds can be used as an effective tool to achieve environmental management and to increase state expenditure on environmental

[269] Australian Department of Mines and Petroleum 2010 *Policy Options for Mining Securities in Western Australia: Preliminary Discussion Paper* 12. The suggestion of this form of environmental fund is discussed in 4.2 below.

[270] McCullough & Lund "Opportunities for Sustainable Mining Pit Lakes in Australia" 2006 *Mine Water and the Environment* 221. Australia is currently experiencing a similar problem to South Africa in regard to acid mine drainage, and this situation is worsened by the lack of regulatory guidelines around water quality standards during rehabilitation.

[271] European Parliament: Directorate-General for Internal Policies, Policy Department A; Economic and Scientific Policy 2010 *Financial Transaction Tax: Small is Beautiful* PE 429.989 at 11.

[272] National Treasury 2010 *Discussion Paper on Carbon Taxes* 8-9.

objectives,[273] especially where socio-economic spending always seems to appear above environmental needs on the budgetary agenda.

An environmental fund is a financial mechanism set up to achieve certain environmental objectives, and can be structured in several different ways.[274] They are particularly appropriate where the issues being addressed are long-term and require a sustained response over a number of years, where existing agencies cannot effectively manage the amount of funds needed to address the problem, leading to the need for an independent administrative body, among other things.[275] Although they are generally funded by the state or international sources, a trust fund system can be used which imposes a tax or fee on a particular activity in order to create a fund dedicated to environmental undertakings.[276] These are especially effective when the earmarked funds are of an insurance pooling nature (ie insurance premium taxes). Although it is a relatively small pool of countries in which taxes are levied on industries or groups to fund insurance pools against potential environmental risks associated with the production or use of the taxed products, both the United States of America and Canada use this model with success. Since statutory funds already exist in South Africa,[277] such a move would not be completely alien to our regulatory system.[278]

[273] Paterson 2006 *PELJ* 102.
[274] Paterson 2006 *PELJ* 102. Different structures include endowment funds (which spend only the interest income, preserving the capital); sinking funds (which spend their entire capital over a fixed period); and revolving funds (which receive new income on a regular basis to replenish the initial capital).
[275] National Treasury 2010 *Draft Policy Paper* 89-91.
[276] Henderson 1995 (2) *SAJELP* 158.
[277] Outside of the context of the environment, existing statutory funds include the workmen's compensation fund, established by the Workmen's Compensation Act 30 of 1941 and the unemployment insurance fund established by the Unemployment Insurance Act 50 of 1991. Ringfencing of funds in the environmental context has taken place in respect of the levies on plastic bags under the Customs and Excise Act 91 of 1964, and most recently the planned levy on tyres which will be used to fund a recycling initiative under the National Environmental Management Waste Act 59 of 2008, and the Integrated Waste Management Plan (IWMP) promulgated under it, GN 983 in *Government Gazette* 34796 of 28 November 2011.
[278] Stavins "Experience with Market-Based Environmental Policy Instruments" in *Handbook on Environmental Economics* 381.

Perhaps the best know environmental fund is the Superfund[279] in the United States of America, which is funded through an excise tax on specified hazardous chemicals.[280] The founding legislation set up a large fund to clean up hazardous waste sites where parties who had caused the pollution could not be found or were unable to pay.[281] The fund could also be used to clean up sites pending cost recoveries from responsible parties, or for emergency spills and imminent hazards requiring immediate action.[282] Despite starting off as a temporary program, but the mid-1980s the Environmental Protection Agency (EPA) who was tasked with administering the fund, had designated hundreds of waste sites as Superfund sites, and had tens of thousands more to investigate for potential inclusion into the programme.[283] However, despite some success, the program is becoming unpopular with industry and government, and calls resound for its winding up.[284] Despite some negative views of this mechanism, the tool has the potential to overcome many of the shortfalls of the current South African legislative framework around mining rehabilitation, in particular the persistent problem of acid mine drainage. In fact, the National Treasury recently met with the US Trade and Development Agency to discuss the possibility of a future tour of the US by South African officials in order to gain insight into how the US' superfund tackles environmental management.[285]

In the mining context in the US, the Abandoned Mine Reclamation Fund[286] set up by the SMCRA is exactly the kind of fund which is needed in South Africa. The objective of

[279] This fund is properly called the hazardous waste clean-up program. Its initial legislation was the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), and was amended by the Superfund Amendments and Reauthorization Act (SARA) in 1986.
[280] Stavins "Experience with Market-Based Environmental Policy Instruments" in *Handbook of Environmental Economics* 381.
[281] Subchapter II, Part A and B, of the CERLA, establish Hazardous Substances Response Trust Fund and a Post-Closure Liability Trust Fund respectively. *Cf* Hird "Environmental Policy and Equity: The Case of the Superfund" 1993 *Journal of Policy Analysis and Management* 324.
[282] Section 9611 of CERLA. These funds can then be claimed back from those responsible for the hazardous substance pollution. *Cf* Hird 1993 *JPAM* 324.
[283] Daley & Layton "Policy Implementation and the Environmental Protection Agency" 2004 32(3) *The Policy Studies Journal* 376.
[284] *Cf* McGee "Superfund: It's Time for Repeal After a Decade of Failure" 1993 *UCLA Journal of Environmental Law and Policy* 21.
[285] BuaNews "SA Treasury Mulls over Acid Mine Drainage Solutions" *Environment* (2011.06.22).
[286] Section 401 of the SMCRA.

this fund is to reclaim and rehabilitate land and water resources adversely affected by past coal mining, and it includes the objective of rehabilitating abandoned surface mine areas and land negatively affected by past mining practices.[287] Revenue is generated through user charges, donations, reclamation fees levied on mines[288] and interest earned on the fund.[289] This kind of fund is exactly what is needed in South Africa, both in terms of its objectives and its revenue raising style.

In Manitoba, Canada, an environmental contingency fund is created by the Environment Act,[290] to be used at the request of the minister of the environment in cases of environmental emergency, and is funded by the revenues generated by the sale of emissions rights for designated pollutants.[291] This model therefore uses the revenue from an existing MBI (the emission rights) to fund an environmental trust fund, and is the type of instrument which is argued below to be necessary in South Africa.

The Western Australian government has put forward an environmental fund as an option for consideration as an alternative to the performance guarantees (ie environmental bonds) which are currently required.[292] Each mining operator would be required to contribute to the Mining Security Fidelity Fund, and would have to cover the cost of their own rehabilitation and closure expenses, but would not have to provide a performance guarantee. The fund would then be used by the government to cover the closure costs on those sites where it is obligated to undertake work as a result of the company being unable to fulfil its obligations.[293] This model is put forward here as appropriate and desirable for use in South Africa, apart from the fact that the

[287] Section 401(c)(1) of SMCRA.
[288] The reclamation fee is imposed by section 402 of SMCRA, and is a levy charged per ton of coal produced (13.5 cents per ton). In this way the environmental cost is built into the price of the coal, and revenue is raised directly to rehabilitate land which is not otherwise going to be seen to.
[289] Section 401(b) of SMCRA.
[290] The Environment Act, C.C.S.M. c. E125, s45.
[291] Section 45 of the Environment Act, C.C.S.M. c E125; *Cf* Benedickson *Environmental Law* 363.
[292] Australian Department of Mines and Petroleum 2010 *Policy Options for Mining Securities in Western Australia: Preliminary Discussion Paper* 12.
[293] *Ibid*.

performance bond is taken out of the equation. Where the performance bond is required on top of the contribution into the fund, there is a higher likelihood that enough money will be set aside for the purposes of rehabilitation and closure of mining sites. Since the bond is returned once the mining company's obligations have been met, and since the obligation to rehabilitate and close the mine remains unchanged, the performance bond does not cost the mining company more money, but places the state in at a lesser risk of having to take on the company's obligations. This heightened security also means that there is likely to be more money available in the fund for the rehabilitation of ownerless and abandoned mines.

Several important lessons can be learnt from both the use of environmental funds in the US and Canada, and the shortfallings in these systems. The nature of an environmental fund is key in dealing with long-term and perpetual environmental problems such as hazardous waste contamination and acid mine drainage. This tool is used in the US to fund the clean-up of sites which need emergency action, of where the responsible parties cannot be traced. This mechanism therefore provides the specific agency tasked with the clean-up immediate access to funds and a means of acting without having to be dependent on the general budget. This is a key design aspect which is needed in the South African mining industry, which is currently dependent on the national Budget to fund the treatment and avoidance of acid mine drainage and the rehabilitation of ownerless and abandoned mines. The reliance on the tax payer alone to foot the bill for the necessary rehabilitation falls foul of the polluter pays principle enshrined in NEMA,[294] and the costs of controlling the rising water levels in old gold mines, treating polluted water and rehabilitating ownerless and abandoned mines is astronomical.[295] The fund in Canada demonstrates a simple and effective

[294] Section 4(p) of NEMA.

[295] A budget of R924 million was requested by the Department of Water Affairs to the National Treasury for capital expenditure to spend on AMD, according to the "AMD Progress Reports: Department, Trans Caledon Tunnel Authority, & Minteck" of 7 September 2011. The Trans Caledon Tunnel Authority estimated in June 2011 that the cost of setting up temporary measures to treat AMD would be close to R750 million, according to de Waal J "MPs to Discuss Tax Levy for Acid Drainage" *Miningmx* (2011.06.22). It is estimated that there are 6000 ownerless and abandoned mines around South Africa, and that the cost of rehabilitating these would be close to R1.5 billion, according to the Department of Mineral Resources. See I-Net Bridge "Derelict mines to cost R1.5 billion" *Miningmx* (2010.09.15).

means of revenue raising, through the conjunctive use of two separate MBIs, and this form of collaboration is put forward as the right design for the South African environmental fund and its revenue raising techniques. Another option for raising revenue is the direct contribution by current mines, as is the case in the option put forward by the Western Australian government. Although this option is more straightforward and involves less administration, it is likely to garner less public support, and less co-operation from the mining industry. However, with education and co-operation with all stakeholders, this option could be viable and desirable.

4.3 Environmental Tax

As with performance bonds, environmental tax is already in use in South Africa (although not in the mining context). In fact, it is the preferred tool in the National Treasury's toolbox, and is capable of raising revenue for the state whilst accomplishing environmental goals. The environmentally-related Pigouvian[296] tax seeks to correct the market price of a good or service by imposing a tax equivalent to the cost of the negative environmental externality.[297] This category covers several types of charges and fees, as well as product taxes, and is widely used worldwide either to achieve environmental objectives or to raise revenue. Environmental taxes may be applied to industrial inputs (ie resources consumed), on pollution emissions discharged into the environment, or on waste, and can also be applied at the point of consumption by individual purchasers (although this is much more administratively difficult).[298] They are primarily imposed on the energy in the transport and heating sectors, as well as vehicles and electricity.[299] There has been an increasing use of environmental taxes and

[296] This form of tax is named after AC Pigou, whose seminal work, *The Economics of Welfare* (1946) inspired economists and policymakers.
[297] National Treasury 2010 *Discussion Paper on Carbon Tax* 26.
[298] Benedickson *Environmental Law* 365.
[299] Whitten et al 2004 *Proceedings of the sixth Annual AARES National Symposium* 12.

similar instruments across the OECD, with taxes amounting to around 2% of the GDP and about 5.5% of the total tax revenue.[300]

A topical environmental tax which is being either considered or implemented in several jurisdictions is carbon tax. Countries currently considering the introduction of such a tax include Canada and South Africa,[301] while Australia is set to introduce carbon tax in July 2012.[302] Several European countries have already implemented this MBI, including Sweden, Finland, Norway, Denmark, Switzerland and Ireland, and several more look set to follow suit.[303]

The advantage of this kind of tax environmental is its potential 'double dividend' through the recycling of revenue received from environmental taxes in order to reduce taxes on 'goods' such as labour.[304] The second dividend usually results in an increase in welfare or GDP, or a decrease in unemployment, since the scope exists for the decrease of taxes on income, while the first dividend achieves the environmental objective behind the tax.[305] In this way the tool achieves supreme efficiency, since a single tool manages to achieve several goals.

Although the South African government is clearly well aware of the advantages of environmental taxes, they could be used more effectively in the mining context as a device to slow the use of non-renewable minerals, and as a method of raising revenue to invest in an environmental fund to assist in efforts to rehabilitate abandoned and ownerless mines, as well as to treat acid mine drainage. By introducing an environmental tax in the mining context, the price mechanism internalises the cost to the environment (although the full price of the environmental degradation may not be

[300] *Ibid*.
[301] *Cf* National Treasury 2010 *Discussion Paper on Carbon Tax;* Benedickson *Environmental Law* 365.
[302] Reuters "Australian Senate Passes Carbon Tax" *The Guardian* (2011.11.08).
[303] Elbese & de Perthuis "Twenty Years of Carbon Tax in Europe" 2011 *Les Cahiers de la Chaire Economie du Climat* 4.
[304] Patuelle et al "Environmental Tax Reform and the Double Dividend" 2005 *Ecological Economics* 565-566.
[305] Van Heerden J *et al* 2006 *South African Journal of Environmental Management and Science* 537.

included),[306] slowing resource use, and the need for rehabilitation is therefore decreased. Revenue is raised for use either in the general fiscus, or in a ringfenced fund to achieve specific environmental purposes.

4.4 Tax Incentives

Another tax-based MBI, these tools use tax incentives to encourage desired behaviour rather than to build the externality into the price of items, as the previous tool did. These tax benefits, also known as tax differentiation, come in the form of tax deductions or write-offs, credits and subsidies of environmentally desirable behaviour, and are widely used as they can easily be built into existing regulatory systems.

Examples of this type of tool abound, both in South Africa and in other jurisdictions. In Europe, countries have used tax differentiation to reduce vehicle-related emissions by encouraging the switch from leaded to unleaded petrol and by encouraging clean car sales, which it can be argued led to a drastic reduction in the market share of leaded petrol in Europe between 1985 and 1995.[307] A type of tax differentiation tool is accelerated depreciation, which allows the capital expenditure incurred through the acquisition of a given item to be set off against business income more rapidly than would otherwise be permissible.[308] Accelerated depreciation is used in Canada in relation to eligible pollution-control equipment,[309] as well as in Germany and France for

[306] Henderson 1995 (2) *SAJELP* 155. Henderson argues that the setting of a tax rate must be arbitrary to some extent, since if the tax were designed to internalise all external costs, it would be too high, negatively affecting the economy. However, if the cost is set too low, it will fail to influence economic decisions, and will therefore fail to achieve its objective. The cost must therefore be designed in an optimum manner to affect economic behaviour in the desired manner.
[307] Stavins "Experience with Market-Based Environmental Policy Instruments" in *Handbook on Environmental Economics* 389.
[308] Benedickson *Environmental Law* 366. This type of tax incentive is used currently in South Africa in the context of recycling and treatment machinery, under section 37C of the Income Tax Act. See also introduction above.
[309] Benedickson *Environmental Law* 366.

pollution reduction equipment, and in the Netherlands for specified environmental technologies.[310]

South Africa also uses the tool of accelerated depreciation, along with several other tax incentives. In the mining context, tax incentives are used to encourage compliance with mining companies' obligations to rehabilitate mines, and to spend the money set aside by them for this purpose on the correct activities.[311] However, as discussed above, the tool currently has a very narrow environmental objective, and negatively impacts the regulation of the mining sector by seemingly needing to incentivise compliance with legal obligations.

Although these tax incentives are already in place in South Africa, they could be better utilised in the mining context to overcome several of the weaknesses in the current regulatory regime. The lessons to be learnt from other jurisdictions is mainly that this tool needs to be utilised more, with a specific focus on changing the behaviour of mining companies without damaging the economy.[312]

4.5 Mitigation Banking

The concept of mitigation banking is used in the United States of America in relation to the conservation of valuable ecosystems, especially wetlands, and uses a 'no net loss' approach.[313] Under this concept, all wetland losses should be avoided, and where losses are impossible to prevent, they must be minimised and offset by corresponding increases in the protection and/or the development of other wetlands.[314] In order to

[310] Stavins "Experience with Market-Based Environmental Policy Instruments" in *Handbook on Environmental Economics* 391.
[311] Section 37C of the Income Tax Act. See 3.3.2 above.
[312] The risk to the economy is discussed below in Chapter 5.
[313] Clean Water Act 86 Stat. 816 (1972). Under this Act the federal government requires mitigation for the disturbance and destruction of wetlands, streams, or endangered wildlife habitats. *Cf* Di Leva *op cit* note 24 at 89.
[314] Di Leva 2002 *Review of European Community and International Environmental Law* 89.

enable development which cannot avoid wetland losses to take place, an incentive needs to exist in order to encourage the private sector to protect biodiversity – this is achieved through wetland mitigation banking.[315] A 'mitigation bank' is created, which purchases and restores degraded wetlands, or in certain cases creates approved wetlands, and credits are calculated and stored; developers can then purchase these credits and withdraw them from the bank to compensate for wetland filling elsewhere.[316] Since the wetlands which are being filled in by developers are being 'replaced' by the banks, there is no 'net loss' of wetland overall, since the areas purchased by the banks must be kept in perpetuity as wetlands. This practice is now widespread in the US since the 1977 amendments to the Clean Water Act, and has become a means of consolidating the previous haphazard approach to wetland mitigation.[317]

However, this system is difficult to incentivise, since profit margins are not dependable, and some environmental critics of the banking system not that wetlands are difficult to build, and that failure of manmade wetlands is common.[318] Further, there is no legal mechanism to ensure that the 'banks' are financially sustained over time, leading to the fear that since they are difficult to physically maintain in the long run, the wetlands will not be conserved in perpetuity, and the valuable ecosystem will be lost despite the state's efforts.[319] Despite some difficulties, mitigation banks which take over large areas have succeeded, and are even argued to be environmentally superior to many small, isolated wetland parcels.[320] Furthermore, legal instruments can be put in place

[315] Spieles "Vegetation Development in Created, Restored, and Enhanced Mitigation Wetland Banks" 2005 *Wetlands* 51. By 2002 there were 219 active mitigation banks in the United States of America, which covered 50,000 hectares in 29 states. These included restored as well as man-made wetlands. The study carried out by Spieles in 2005 indicated that over time the wetlands self-organised, and had the potential to reach vegetative equivalence with natural wetlands.

[316] Section 404 of the Clean Water Act 86 Stat. 816 (1972). Di Leva 2002 *Review of European Community & International Law* 89.

[317] Spieles 2005 *Wetlands* 51.

[318] Di Leva 2002 *Review of European Community & International Law* 90. Critics argue that in reality virtually no replacement wetland will fully replace the natural wetland functions they are intended to offset, and that in order to achieve the no-net-loss goal wetlands will have to be replaced at more than a 1:1 ratio.

[319] Di Leva 2002 *Review of European Community & International Law* 90.

[320] Di Leva 2002 *Review of European Community & International Law* 89.

to maintain the banked areas in perpetuity, and this MBI can be coupled with others to strengthen weaknesses inherent in it.

Offsets, which were first formalised in the USA in the 1970s for wetland mitigation, are a more crude version of mitigation banking, and are now used globally, including in South Africa, in order to mitigate the loss of biodiversity due to development.[321] In New South Wales, the government has passed a bill which provides for negotiation for 'biodiversity banking and offsets' in order to address native vegetation clearing for urbanisation and the resultant biodiversity loss.[322] Using this tool, residents can generate 'biodiversity credits' if they commit to enhance and protect biodiversity values on their land, and these credits can then be sold to offset the likely impacts on biodiversity values due to development.[323] In South Africa, the concept of offsets is relatively new, but is being used in the context of biodiversity.[324] The Western Cape provincial government published a *Provincial Guideline on Biodiversity Offsets*[325] in 2008,[326] which offers guidance on the meaning and use of biodiversity offsets. The *Provincial Guideline on Biodiversity Offsets* also sets out means to calculate the size[327]

[321] Burgin "Biobanking: An Environmental Scientist's View of the Role of Biodiversity Banking Offsets in Conservation" 2008 *Biodiversity and Conservation* 807.
[322] Threatened Species Conservation Amendment (Biodiversity) Bill 2006, which inserts a new Part 7A into the Threatened Species Conservation Act 1997. *Cf* Burgin *op cit* note 240 at 808-809.
[323] Burgin 2008 *Biodiversity and Conservation* 809.
[324] Under the National Environmental Management Biodiversity Act 10 of 2004, the National Biodiversity Strategy Act Plan (NBSAP) of 2005 explicitly recognises the need for biodiversity offsets, and biodiversity plans at different scales identify priority areas and areas which are irreplaceable for biodiversity conservation, to become 'receiving areas' for biodiversity offsets.
[325] Department of Environmental Affairs and Development Planning 2007 *Provincial Guideline on Biodiversity Offsets.* Republic of South Africa, Provincial Government of the Western Cape, Department of Environmental Affairs & Development Planning, Cape Town.
[326] These *Guidelines* draw on the provisions made for offsets in biodiversity plans and the National Biodiversity Strategy Action Plan (NBSAP), as well as the Western Cape Provincial Spatial Development Framework of 2005 *inter alia.* They set out to provide authorities, project proponents, conservation planners, town and regional planners, environmental assessment practitioners, specialists and non-governmental organisations, among others, with guidance as to a common understanding of what offsets are, when they should be used, the process and procedures to be followed, how to incorporate them into EIA decision-making, and how to monitor and manage offsets. They also set out to facilitate discussion among stakeholders, which reflects the uncertainty in South Africa and globally around the exact parameters and meanings of biodiversity offsets.
[327] Department of Environmental Affairs and Development Planning 2007 *Provincial Guidelines* 51-55. The physical area of the offset that would be required to compensate adequately for residual negative impacts on biodiversity is determined using ratios, which are then adjusted based on additional considerations. Offsets of 30:1 are required for impacts in critically endangered ecosystems (where there

and location[328] of the offset, the design process[329] and long-term planning[330] to be followed and key considerations in the evaluation of offset proposals.[331] This tool is also being slowly introduced into the mining context internationally, with the International Council of Mining and Metals (ICMM) proposing the use of biodiversity offsets,[332] and several countries are legislating the use of offsets (either as mandatory or advisory) as part of their conservation and sustainable development requirements.[333] Offsets may be the only way for mining companies to meet states' objectives of limiting biodiversity loss, since mining may have to take place in ecologically sensitive areas, and mitigation of the residual impacts of mining may be impossible in the mining area itself.[334]

Despite their widespread use, however, certain weaknesses do exist in the offset programs, and specifically in the biodiversity bank initiative in New Zealand. Firstly, there is flawed logic in offsetting one area for development with another for conservation, since the ecosystem lost may not be offset with something of conservation value.[335] This is especially true in areas such as the Western Cape, which

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are exceptional circumstances allowing for development), 20:1 for residual impacts in endangered ecosystems and 10:1 for residual impacts in vulnerable ecosystems. No offsets are required for the least threatened ecosystems.

[328] Department of Environmental Affairs and Development Planning 2007 *Provincial Guidelines* 56-57. Offsets which are purchased off-site from the development should be located in offset 'receiving areas' which either protect or link biodiversity priority areas and consolidate ecological corridors in the landscape identified in the SDF, biodiversity, bioregional or conservation plans, fine scale bioregional plant, *inter alia*. CapeNature must play a role in identifying the appropriate offset areas, according to the *Guidelines*, and the site selected should be close to the impact site and cause minimal fragmentation of habitat. It should also provide comparable ecosystem services to those delivered by the impacted site.

[329] See Chapter 5 of the *Provincial Guidelines* 42-65.

[330] An Offset Management Plan must be created and implemented, according to the *Provincial Guidelines* 65.

[331] The *Provincial Guidelines* focus on the EIA process as the stage at which offsets will be considered, and it sets out the various steps in this process at which offsets should be investigated, evaluated and decided upon (24-41). Provision is also made for the monitoring and auditing of offsets (41-42).

[332] International Council on Mining & Metals 2005 *Biodiversity Offsets – A Briefing Paper for the Mining Industry* London, United Kingdom.

[333] Examples of offset related legislation can be found in Europe, in the *Habitats and Birds Directives and implementing regulations under Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and wild fauna and flora and Council Directive 79/409/EC, Environmental Liability Directive;* and in Canada, the *Fisheries Act under R.S. 1985, c, F-14 policy for Management of Fish Habitat (1986)* and the *Habitat Conservation and Protection Guidelines,* 2ed (1998).

[334] ICMM 2005 *Briefing Paper* 2.

[335] Burgin 2008 *Biodiversity & Conservation* 811.

are biodiversity rich, but in which many species are severely threatened and may only occur in one area. The *Provincial Guideline on Biodiversity Offsets* take these concerns into consideration, but fail to substantially solve the problem, since offsets are still allowed off site, and in certain instances monetary compensation is allowed.[336] Secondly, where restoration efforts in creating offsets target sites of deforestation, mining or development, it is unrealistic to assume that the full suite of ecosystem services can be restored, given the current state of the science.[337] Several other weaknesses have been raised in relation to this tool, including the basis for determining the value of biodiversity and the lack of management and compliance of offsets.

Despite certain weaknesses, the idea of mitigation or biodiversity banking is one which could be usefully adapted to the South African mining context, and the idea has been implemented recently.[338] However, given the weaknesses which have been highlighted, much work will have to be done to ensure that South African biodiversity and natural resources are protected if offset agreements and mitigation banking are used.

[336] In certain instances, developers are allowed to make contributions into an accredited biodiversity conservation fund, revolving land trust or dedicated offset fund in lieu of physical offsets. *Provincial Guidelines* 46.

[337] Palmer & Solange "Restoration of Ecosystem Services for Environmental Markets" 2009 *Science* 575; Groenewald "Mapungubwe Mining Go-Ahead" *M&G Online* (2011.09.02).

[338] The Australian mining company Coal of Africa recently entered into a biodiversity offset agreement with the Department of Environmental Affairs and South African National Parks regarding its Vele Colliery which s seven kilometres away from the Mapungubwe world heritage site. However the details of this agreement have not yet been finalised or released, and it remains to be seen whether the environment will be sufficiently protected. *Cf* Smith "Coal of Africa signs Environmental Deal" *Business Day* (2011.09.02).

Chapter 5: Amending and/or extending the use of market-based instruments in South Africa's mining regime – looking towards the future

The current regulation of environmental rehabilitation in South Africa's mining industry through MBIs is not working. This fact is evidenced by an abundance of ownerless and abandoned mines, a growing acid mine drainage problem which is threatening to mature into a potential disaster, both environmentally and economically, and widespread acknowledgement that mines are still one of the leading causes of environmental degradation.

This failure is due to the narrow scope of the MBIs currently in place, which leave gaps and inefficiencies in the regulatory framework, and there is much scope for improvement. However, since the National Treasury has advocated for the increased use of MBIs,[339] such improvement seems eminently possible. Several incentive-based tools exist both within and outside of this jurisdiction which could be used to shore up the rehabilitation regulations.[340] In this way, an environment can be created which encourages on-going and thorough environmental rehabilitation in the mining sector, as well as creating tools to begin to repair some of the damage caused in the past and to ensure that it is remedied sufficiently to realise everyone's environmental right.

In order to evaluate the suitability of the five tools identified as potentially apposite for South Africa's mining rehabilitation needs and existing regulatory framework, I will use the eight criteria identified by academics[341] and the National Treasury, highlighted in

[339] In the 2006 *Draft Policy Paper,* National Treasury clearly sets out its intents to introduce more market-based instruments into the environmental regulatory framework, especially in the form of environmental tax, and it has given practical effect to these stated intentions through a vast number of developments. *Cf* Paterson 2009 *SAJELP.*

[340] These have been discussed in Chapter 4.

[341] Paterson "An Incentive-Based Approach to Environmental Regulation" in *Environmental Compliance and Enforcement in South Africa* 329-335. Paterson sets out guidelines for extending the use of incentive-based instruments in South Africa, which are based on the criteria in the National Treasury 2006 *Draft*

Chapter 3. These criteria are: environmental effectiveness, technical and administrative issues, legislative aspects, policy, legal and institutional alignment, public support, tax revenue, distributional impact and competitiveness impacts. Furthermore, the tax-based incentives must conform to the generally accepted principles of good taxation – efficiency, equity, certainty, simplicity and cost minimisation.[342]

5.1 Environmental Effectiveness

In order to be suitable as a tool, the incentive-based instrument which has been selected for a task must be environmentally effective, which is to say there must be a direct and rational link between the instrument and the environmental objective it seeks to achieve.[343] The stronger the link between the instrument and the objective, the more likely it will be to change the intended behaviour, and the fewer unintended side effects will occur.[344]

The five instruments discussed in Chapter Four range from those seeking to achieve broad environmental objectives to those seeking to achieve narrow environmental goals. In the case of broad objectives, there may be certain instances where a direct link the instrument and the objective is not feasible, and in such a circumstances policy-makers should ensure that the next closest alternate link is used, and that any exemptions are kept to a minimum.[345] Both tax-based incentives, in the form of environmental taxes and tax incentives or benefits, can be viewed as seeking to achieve broad environmental objectives, and the imposition of these instruments runs the risk of causing unexpected consequences. The environmental fund also runs the risk of not

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Policy Paper, but are broadened to encompass the assessment of all incentive-based instruments rather than simply the environmental taxes focused on in the policy paper. *Cf* Paterson "An Incentive-Based Approach to Environmental Regulation" in *Environmental Compliance and Enforcement in South Africa* 329-334.

[342] National Treasury 2006 *Draft Policy Paper* vii-viii.

[343] Paterson "An Incentive-Based Approach to Environmental Regulation" in *Environmental Compliance and Enforcement in South Africa* 329.

[344] National Treasury 2006 *Draft Policy Paper* 59.

[345] Paterson "An Incentive-Based Approach to Environmental Regulation" in *Environmental Compliance and Enforcement in South Africa* 329-330.

meeting the environmental effectiveness criteria, since the funding proposed for this instrument is one of the previous two tools, and there could therefore be a knock-on effect, despite the fact that the tool itself can be created with a relatively narrow environmental objective.

The final two instruments – performance bonds and mitigation banking – both meet the criteria of environmental effectiveness well, having narrow environmental objectives and having a direct link between themselves and the goal they seek to achieve. Therefore, as with all instrument choices, careful planning must be ensured, especially in the case of the first three MBIs examined, since they have the highest chance of causing unexpected consequences.

5.2 Technical and Administrative Viability

Various technical and administrative prerequisites stand in the way of MBIs succeeding, and must be built into the instruments to ensure that they achieve their goal and are able to operate in the regulatory framework.[346] Paterson[347] describes these obstacles as follows: first, the instruments should be designed in such a way as to ensure certainty and simplicity in order to facilitate their implementation and to minimise the confusion on the part of the administrator and the public. Secondly, he advises that they should be designed in such a way as to minimise the cost of implementation and enforcement.[348] This is in line with the argument that one of the reasons to introduce MBIs is to minimise administrative cost and burden,[349] and that they should therefore do so as much as possible. This cost saving and administrative streamlining can most easily be achieved by building new MBIs into existing legal, administrative and

[346] Paterson "An Incentive-Based Approach to Environmental Regulation" in *Environmental Compliance and Enforcement in South Africa* 330. See also National Treasury 2006 *Draft Policy Paper* 61-62.
[347] Paterson "An Incentive-Based Approach to Environmental Regulation" in *Environmental Compliance and Enforcement in South Africa* 330.
[348] Paterson "An Incentive-Based Approach to Environmental Regulation" in *Environmental Compliance and Enforcement in South Africa* 330.
[349] Paterson 2006 *PELJ* 89.

institutional frameworks, where possible.[350] Thirdly, the new tools should not be too expensive to comply with, since this will encourage public support, and will also lessen enforcement costs.[351] Finally, the tool should be uniformly applicable, reducing regional variances or competition which could be open to abuse both by administrators or subjects.[352] However, this prerequisite should not extinguish one of the advantages of the MBI – the flexibility to adapt to a specific context.

The five tools put forward as potential growth areas in the effort to make environmental regulation in the mining context more effective range in terms of how far they are from achieving this criterion. Performance bonds are both certain and simple, and since they already exist in the legal framework. There is therefore little to no implementation and enforcement cost, or extra compliance cost. The changes which have been suggested[353] are merely in how this tool is applied, and it therefore meets this criterion. The same can be said to an extent for the suggestions of environmental tax and tax incentives, since both tools are currently in place in South Africa, and should simply be extended to achieve environmental goals in the mining sector.[354] Several levies have been introduced under the Customs and Excise Act[355] to achieve environmental ends, and this existing legal, administrative and institutional framework can therefore be built on. Various precedents also exist for tax incentives used to achieve environmental objectives, on which the fourth tool to achieve environmental objectives in the mining sector can build.[356] These include several amendments to the Income Tax Act[357] in an attempt to ease the financial burden on industry seeking to

[350] Paterson "An Incentive-Based Approach to Environmental Regulation" in *Environmental Compliance and Enforcement in South Africa* 330.
[351] *Ibid*.
[352] *Ibid*.
[353] See 4.1 above.
[354] See 4.3 and 4.4 above.
[355] Customs and Excise Act 91 of 1964. An example of this is the product tax levied in plastic bags, under Schedule 1 (Part 3A) of the Customs and Excise Act. This product tax is particularly interesting, since the revenue generated by it was ringfenced and went into a section 21 company specifically designed to recycle plastic bags. Although the company was recently dismantled and is viewed by many as a complete failure, since it failed to achieve its environmental objective of recycling, this still sets a precedent for National Treasury, proving that it is not totally opposed to some form of earmarking.
[356] Tax incentives already in existence in the mining rehabilitation context are discussed in 4.4.
[357] Income Tax Act 58 of 1962.

comply with the new environmental regime in South Africa,[358] such as the deduction for income tax purposes of the expense incurred in acquiring 'environmental treatment and recycling assets'.[359] However, care must be taken with the environmental tax to ensure that tax avoidance behaviour is dealt with in the design, and that the tax rate is set at a level which is acceptable to the economy.[360]

The proposed environmental fund would be more difficult to build into the existing legal and administrative framework, and would need its own institution created from scratch. However, although such a fund is not currently in existence in South Africa, the idea has been put forward by the National Treasury[361] as one means of using fiscal incentives to improve environmental outcomes, and several statutory funds do exist in other contexts.[362]

The benchmarks listed by the National Treasury as indicating where environmental funds would be appropriate[363] are also met in the South African mining context: the problem is one which requires a long-term and sustained response, especially in the case of acid mine drainage, which is perpetual in nature; the existing agencies also cannot effectively implement the amount of funds needed to address the problem;[364]

[358] Paterson 2009 *SAJELP* 26.
[359] Section 37B(1) of the Revenue Laws Amendment Act 35 of 2007, which amends the Income Tax Act.
[360] National Treasury 2006 *Draft Policy Paper* 61.
[361] The National Treasury met with the US Trade and Development Agency in 2011 to discuss ways in which their expertise could be utilised in South Africa, with specific reference to how the "super fund" used in tackling environmental management. BuaNews "SA Treasury Mulls Over Acid Mine Drainage Solutions" *Environment* (2011.06.22).
[362] Henderson 1995 (2) *SAJELP* 158. Several statutory funds currently operate in South Africa, but none of these relate to the environment. These include the workmen's compensation fund under the Workmen's Compensation Act 30 of 1941, unemployment insurance under the Unemployment Insurance Act 30 of 1966, and a mining research fund established by regulation 35 of the regulations promulgated under the Minerals Act 50 of 1991.
[363] National Treasury 2006 *Draft Policy Paper,* at 90, sets out several criteria which determine the appropriateness of an environmental fund. These are that: the issues being addressed are long-term and require a sustained response over a number of years; that existing agencies cannot effectively manage the amount of funds needed to address the problem; that there is a community of organisation able to effectively implement the range of activities needed to achieve the intended objective; and that there is support for the fund from all relevant stakeholders, particularly government.
[364] The Department of Mineral Resources has admitted that R1.456 billion is required to rehabilitate the estimated 6,000 ownerless and abandoned mines, and that the department does not have the money and will have to ask National Treasury and the mining industry for contributions. *Cf* Fourie *Business Day*

and there is support for the fund from all relevant stakeholders, particularly government.[365] A report commissioned by the Department of Mineral Resources on the acid mine drainage problem in 2010 seems to confirm that government would view an environmental fund dedicated to dealing with the AMD problem favourably.[366] Coupled with the seeming agreement with environmental funds where the aim is to raise revenue for environmental spending rather than to change behaviour, it seems there is a real chance of an environmental fund with the objective of rehabilitating ownerless and abandoned mines and treating AMD being successful.[367]

On the creation of revenue-raising tools to fund an environmental fund, one option is to earmark all or part of the royalties already levied on all minerals recovered in the Republic.[368] This mechanism would meet the criteria of using existing legislative, administrative and institutional frameworks, and negative impacts on the economy would be minimised in light of the fact that such a levy is already in place. Another option is for the state to provide the revenue for the fund directly, and the mechanism for this is already in place under the MPRDA, which allows Parliament to set aside funds for environmental rehabilitation in the mining context.[369]

(2010.09.15). In the case of the acid mine drainage problems currently being experienced in the goldfields in Gauteng, the state-owned bulk water provider, Trans-Caledon Tunnel Authority, has been appointed to oversee a short-term clean up, and the Finance Minister has set aside R225 million for this period. However, the long-term cost of cleaning up existing damage done by the AMD and treating water in the future to avoid the problem has been estimated as costing in the region of R1.08 billion. *Cf* Salgado *Business Report* (2011.0225); Blaine "Firm to start cleaning up acid mine drainage" *Business Day* (2011.06.01).

[365] National Treasury 2006 *Draft Policy Paper* 90.

[366] Expert Team of the Inter-Ministerial Committee under the Coordination of the Council for Geoscience (2010) *Mine Water Management in the Witwatersrand Gold Fields with Special Emphasis on Acid Mine Drainage* 80. The 'Team of Experts' appointed by the Department of Mineral Resources to investigate options on how to deal with the acid mine drainage problem suggested a public/private partnership as one of the options. The report proposes that such a venture be funded through an environmental levy on all operating mines, to fund the environmental legacies of the mining industry, including acid mine drainage. This would seem to indicate governmental support for both the idea of an environmental tax in the mining context in order to treat AMD, and it is not a big leap to extend such an objective to cover the rehabilitation of abandoned and ownerless mines.

[367] National Treasury 2006 *Draft Policy Paper* 90-91.

[368] The Mineral and Petroleum Royalties Act 28 of 2008 imposes a levy on all minerals recovered in South Africa, and the revenue raised currently goes into the National Revenue Fund.

[369] Section 45(2)(e) of the MPRDA.

One drawback of state funds which are not insurance-based, as the proposed environmental fund would be if it dealt with historical restoration of abandoned and ownerless mines and AMD, is that it potentially offends the polluter pays principle and could be inequitable.[370] The argument can be advanced that existing operations alone should not themselves be held responsible for the cost of pollution which arose in the past where no legal liability can be attached to any person, or where the polluter cannot be traced.[371] However, the mining industry has profited from the lax environmental governance of the past, and it could be argued that although requiring them to pay for the pollution of past users is a 'course kind of justice',[372] it is justified.

The proposed use of mitigation banking is perhaps the least able to fit into the existing frameworks. However, biodiversity offsets are beginning to form part of the South African legislative landscape, and are being used in planning tools created under NEMBA at both a national and provincial level.[373] The cost of administration of mitigation banks would be kept low, since they would be private enterprises, and the legal mechanisms needed to ensure protection in perpetuity are already built into the existing legislation around protected areas.[374] Existing legal protection in the form of title deed restrictions could also be utilised by individual property owners in this context. Owners are able to control what happens to the property in the future through registering a title deed restriction in relation to their property, in this case in

[370] Henderson 1995 (2) *SAJELP* 159.
[371] This problem is especially evidence in relation to AMD and abandoned and ownerless mines, since many of the companies which operated the sites have since ceased to exist, and AMD is a type of pollution in which it is very difficult to pin-point the source.
[372] Henderson 1995 (2) *SAJELP* 159 quotes Gains and Westin as using this argument. However, he disagrees with it, submitting that the State should be held liable for the 'sins of the past' caused by the pollution of past operators from whom the costs of rehabilitation cannot be recovered.
[373] The introduction of these tools, as well as the relevant statutes, policies and planning tools are discussed in 4.5 above.
[374] The National Environmental Management Protected Areas Act 57 of 2003 has a variety of kinds of protected areas, with varying degrees of protection, in Chapter 2, and a register of protected areas must be kept by the Minister, according to section 10. Mitigation banking could be built into this system with relative ease, and the protection in perpetuity is not alien to this Act.

relation to maintaining a certain level of biodiversity and ecosystem functionality, and thereby binding all future purchasers.[375]

Therefore, although they require different levels of effort to work into existing legislative, institutional and administrative frameworks, and in some cases require new bodies to be created or laws to be enacted, all of the suggested MBIs are capable of overcoming the technical and administrative issues before them.

5.3 Legislative Aspects

Ensuring a coherent legislative framework is another prerequisite to ensure the successful introduction of incentive-based instruments into a regulatory regime.[376] Given South Africa's comprehensive legislative framework, as well as the entrenched environmental right in the Constitution, with which all legislation must comply, this criteria is perhaps the least difficult to meet. The broad legislative framework already in existence appears able to cater for the introduction of all of the new instruments, and amendments to existing statutes which have been suggested[377] to accommodate the introduction of MBIs should fit into this scheme with relative ease.[378] The broad regulatory framework already exists and is capable of accommodating all of the necessary changes.

Since the performance bond, environmental tax and tax incentives already exist,[379] these tools do not pose much of a challenge to integrate into the legal framework. However, especially in the case of tax, care must be taken to avoid negative incentives

[375] Van der Merwe & Pope "Servitudes and other real rights" in du Boise (ed) *Wille's Principles of South African Law* 2007 602.
[376] Paterson "An Incentive-Based Approach to Environmental Regulation" in *Environmental Compliance and Enforcement in South Africa* 331.
[377] See 4.1 to 4.5 above.
[378] Paterson "An Incentive-Based Approach to Environmental Regulation" in *Environmental Compliance and Enforcement in South Africa* 331.
[379] See 4.1, 4.3 and 4.4 above. In the case of the performance bond, amendments to the MPRDA will be sufficient. However, with environmental tax and tax incentives, more drastic amendments to the existing laws in which these instruments appear may have to be undertaken, and new statutes could be introduced should this overhaul prove too large for simple changes to existing laws.

being created. These may clash with the broader legislative aims and policy directions, and may therefore not sit well with other areas of governance. The mechanisms for creating statutory funds already exist, and an environmental fund is under consideration by the National Treasury as one option in tackling the AMD problems and ownerless and abandoned mine rehabilitation.[380] The mitigation banking tool can be built into mechanisms which make provision for biodiversity offsets, with the difference between the two mechanisms being minor.

Any MBIs which are introduced must also comply with the country's international and regional obligations.[381] However, the government is well aware of this aspect in the introduction of MBIs, and will need to ensure that both environmental and trade objectives are aligned.[382] It can therefore safely be assumed that any new or adjusted MBI would be compatible with regional and international obligations before the government introduced it into the regulatory framework.

5.4 Policy, Legal and Institutional Alignment

The alignment of new MBIs with the broader policy, legislative and institutional framework is essential in ensuring that the new tool succeeds, and that it is compatible with the overall objectives of the existing system.[383] Although the environmental objectives of the proposed MBIs are clearly in line with the goals of environmental protection contained in section 24 of the Constitution, there is a chance that such instruments, in taking revenue away from the general stream, might not align with the national socio-economic policy objectives which seek to achieve economic growth, job

[380] BuaNews *Environment* (2011.06.22).
[381] Paterson "An Incentive-Based Approach to Environmental Regulation" in *Environmental Compliance and Enforcement in South Africa* 331.
[382] National Treasury 2006 *Draft Policy Paper* 12. In relation to environmental taxes, the National Treasury has recognised the need to align the measures with World Trade Organisation rules and possibly with on-going tax harmonisation efforts within SADC (at vii). In relation to ensuring that trade obligations are met, border tax has been investigated in relation to carbon tax in National Treasury's 2010 *Discussion Paper on Carbon Taxes* 40-42.
[383] Paterson "An Incentive-Based Approach to Environmental Regulation" in *Environmental Compliance and Enforcement in South Africa* 331.

creation and poverty alleviation.[384] However, if there is careful consideration of the design of each instrument, and if the tenets of sustainable development are respected, there is no reason why each of the proposed instruments should not meet this criterion.

Since performance bonds are relatively narrow, they affect the mines almost exclusively, and therefore meet this criterion the most easily of all the tools. Mitigation banking is also relatively narrow, but could possibly clash with the socio-economic imperatives such as housing. This should therefore be taken into account in the design of this tool. Tax incentives seem narrow in focus, but are in reality a write-off of certain tax by the government in the interest of achieving a larger goal. However, in a country such as South Africa, which has a limited tax base, such a move must be carefully considered, and all of the effects must be weighed against the benefits derived from this tool. Finally, environmental taxes and environmental funds are the tools which potentially clash with this criterion the most. Since the National Treasury is generally opposed to ring-fencing of funds, and is careful about what taxes it imposes, it can be assumed that the suggestion of the introduction of these two MBIs has come with careful consideration of their potential effects, and provision should be made for the mitigation of negative impacts.

Although all of the MBIs seem to be in line with the environmental objectives, and can assist in overcoming many of the weaknesses of the existing regulatory system,[385] traditional compliance and enforcement tools should still be invested in. There is a danger in assuming that a MBI by itself can achieve the desired policy goals, since without a powerful and adequately enforced regulatory framework, unexpected consequences can arise and the economy may end up being negatively affected.[386]

[384] Paterson "An Incentive-Based Approach to Environmental Regulation" in *Environmental Compliance and Enforcement in South Africa* 331.
[385] See the weaknesses of the command-and-control system discussed in Chapter 3.
[386] Macrory *Regulation, Enforcement and Governance in Environmental Law* 2008 162.

There should also be as much certainty as possible on the consequences which will flow from the introduction of any measure in order to achieve the stated objectives with the maximum amount of efficiency.[387] To ensure this, there should also be as much cross-consultation as possible between relevant environmental and fiscal authorities during the design and implementation stages of the new tools.[388]

Linked to this, and imperative in ensuring the success of the new regime, will be the achievement of co-operative governance. This is currently lacking between the Departments of Water and Environmental Affairs and Mineral Resources, as evidenced by the discussion of *MaccSands* case[389] and the issues around the moving of environmental authorisations in the mining context into the realm of the Department of Environmental Affairs.[390] This is happening despite being a constitutional imperative to ensure co-operative governance,[391] and it is essential that a better working relationship is formed between the provincial and national environmental bodies, as well as between the national departments, especially Environmental Affairs and Mineral Resources.[392]

5.5 Public Support

As with most new laws which require the public to behave in a certain way, the success of incentive-based instruments is often dependent on accruing public support prior to its implementation.[393] However, most of the MBIs which have been outlined above will

[387] Henderson 1995 (1) *SAJELP* 64.
[388] Paterson "An Incentive-Based Approach to Environmental Regulation" in *Environmental Compliance and Enforcement in South Africa* 332.
[389] See introduction to Chapter 3.
[390] See 3.2.1 above for a discussion around the desirability of moving the environmental authorisations into the sphere of the Department of Environmental Affairs.
[391] Chapter 3 (sections 40 and 41) of the Constitution of the Republic of South Africa, 1996.
[392] The first step in overcoming the stale mate which has developed between the mining and environmental branches of government is the enactment of the legislation which would bring the environmental authorisation regime in the mining context under the control of the NEMA, discussed in 3.2.1.
[393] Paterson "An Incentive-Based Approach to Environmental Regulation" in *Environmental Compliance and Enforcement in South Africa* 332.

impose additional costs, especially on industries, but also individuals and organisations. However, these tools are necessary to fund government activities, and to provide public goods and services, as well as to achieve necessary environmental objectives which will benefit everyone in the long run, either directly or indirectly.[394] Only in the case of tax incentives and performance bonds are the incentives positive, while the mitigation banking, environmental fund and environmental tax would all require additional outlay by those affected.

In order to try to win public support, the government should ensure that the environmental objectives and how they relate to the instrument are made clear to the public. The instrument should therefore be clear, simple, and easy to use and administer, and should be explained to the clearly identified stakeholders.[395] Further, all relevant stakeholders should be engaged in the assessment process, and gradual implementation with sufficient warning will further smooth the process of introduction.[396]

The process of garnering public support for some tools will be easier than others. The performance bonds and tax-based instruments are already in existence, and are therefore not alien to the public. These should therefore be easier to introduce, and meet the criteria relatively well, since only the changes in environmental objective sought to be achieved needs to be thoroughly explained. The environmental fund could prove difficult to win the mining industry over with, but considering the fact that it is clearly necessary in the context of rehabilitation of ownerless and abandoned mines and acid mine drainage, and the fact that industry will be asked to contribute to this process whatever the type of tool used, support could be achieved eventually. In the case of mitigation banking, the idea is not entirely foreign in this country, with offsets already being used in biodiversity conservation during the environmental impact

[394] See National Treasury 2006 *Draft Policy Paper* 60.
[395] Paterson "An Incentive-Based Approach to Environmental Regulation" in *Environmental Compliance and Enforcement in South Africa* 333.
[396] *Ibid*.

assessment process,[397] as well as being integrated into various planning tools.[398] Biodiversity offsets are being proposed internationally by the International Council on Mining and Minerals as a key mitigation tool and an important part of an industry which has such serious effects on the environment in general, and biodiversity specifically.[399] Voluntary biodiversity offsets have been entered into in South Africa by mining companies, and are an important means of ensuring that key ecosystems are conserved.[400] Therefore with enough involvement of the stakeholders, even the mitigation banking tool can meet the criteria of public support.

5.6 Tax Revenue

Determining the level of taxation or charge to levy on goods in order to either raise revenue or internalise an externality in order to influence behaviour through the price mechanisms is a key design criterion, and may determine the success or failure of a tool.[401] This is because there are implications for taxes or incentives that are set too high or too low. Where a tax is set too high in respect of a product for which there is an inelastic demand, consumption patterns may not change (although revenue may be easily raised) while a rate which is set too low may not achieve the objective which the MBI sets out to achieve.[402] Therefore the process of setting the rate must be as scientific as possible, and must undergo a rigorous cost-benefit analysis to ensure that

[397] Brownlie S & Botha M "Biodiversity offsets: Addition to the Conservation Estate, or 'No Net Loss'?" 2009 *Impact Assessment and Project Appraisal* 227.

[398] At a national level, the *National Biodiversity Strategy Action Plan* (NBSAP) 2005, created by the Department of Environmental Affairs and Tourism (as it then was), under the National Environmental Management Biodiversity Act 10 of 2004, explicitly recognises the need for biodiversity offsets. At a provincial level, the Western Cape Spatial Development Framework (SDF), approved by the Provincial Cabinet in 2005, creates a policy framework which incorporates biodiversity offsets in order to curb the continueal erosion of biodiversity in the province. *Cf* Brownlie & Botha 2009 *IAPA* 228.

[399] The ICMM reports that, over and above complying with biodiversity offsets in countries in which they form part of the legislative framework (such as the USA, Brazil, Europe and Canada), certain big mining companies are also participating in voluntary offsets. This is encouraging given the frequent overlap between active mining and exploratory sites and areas of high conservation value worldwide, including in jurisdictions (such as South Africa) which do not yet require biodiversity offsets to be undertaken. *Cf* International Council on Mining & Metals (2005) *Biodiversity Offsets – A Briefing Paper* United Kingdom.

[400] See 4.5 above.

[401] See Paterson "An Incentive-Based Approach to Environmental Regulation" in *Environmental Compliance and Enforcement in South Africa* 333.

[402] Henderson 1995 (1) *SAJELP* 64.

the fiscal measure will achieve the environmental benefit without damaging the economy.[403]

Tax incentives and performance bonds, as positive incentives, are least likely to offend this criterion (although as tax incentives which are too high risk affecting the national revenue amount). Mitigation banking may impose a limited cost, depending on how much it costs the mines to establish these banks, and this will have to be taken into account when designing the tool. The environmental fund will vary in its compliance with this criterion depending on its design, but whether the state contributes to the fund or the mines make direct contributions, either in the form of tax or charge, this MBI must be carefully constructed so as not to negatively affect the economy.

In the case of environmental taxes (by themselves and as a tool to raise revenue for the environmental fund), there is a potential to place a great burden on industry, which could in turn hamper economic growth, especially in a mining industry which provides as many jobs as it does in the South African economy. Henderson[404] argues that in the case of the mining industry, fiscal incentives should be applies as far as possible in a way that does not have the effect of increasing working costs. However, the economy is no longer the most important consideration, and it must be balanced with the need to protect the environment.

Although traditional tax theory, and the theory of tax neutrality, favours taxing price inelastic goods, which provide revenue without decreasing demand, environmental tax is used to mould behaviour (along with raising revenue), and therefore goods which are taxed may be price elastic in nature in this context.[405] A related issue in the context of environmental tax (and especially its potential use as a source of revenue for the environmental fund) is the issue or earmarking or ringfencing, which was briefly

[403] *Ibid*.
[404] Henderson 1995 (1) *SAJELP* 63. He cites the Government of the Republic of South Africa *Report of the Committee on Gold Mining Taxation* U.G. 16-1946 1-4.
[405] Paterson "An Incentive-Based Approach to Environmental Regulation" in *Environmental Compliance and Enforcement in South Africa* 333. In fact, in many instances the goods are taxed precisely because the environmental objective is to decrease the demand for that product.

discussed above. The National Treasury has indicated that it is generally opposed to full earmarking of tax revenues given that this places undue constraints on the budget process and may lead to inappropriate allocation of resources.[406] However, given the recognised need for environmental protection, and the requirement for some of the suggested instruments listed above to be funded by state expenditure, this stance may have to change. Indications of the recognition of this possibility have appeared in recent policy documents which support partial earmarking of revenue,[407] and precedent exists for full earmarking,[408] though not in the environmental arena. There is therefore hope for the future of at least some form of dedicated revenue to environmental objectives.

5.7 Distributional Impacts

Despite the fact that MBIs are more equitable than command-and-control regulations, the potential exists for the impact of their introduction to negatively impact low income groups. This design criterion is especially pertinent in South Africa, where significant inequalities exist between different sectors of society, and the price mechanism could prove to add to the already difficult task facing those at the lower end of the income scale.[409] Ideally, the design of a new instrument should insure that the costs associated with its implementation are equitably and proportionally distributed across the various sectors of society relative to their economic means.[410]

Where the cost is directly levied on the mining companies, such as by means of tax incentives, performance bonds and mitigation banking, the effects are less likely to be

[406] National Treasury 2006 *Draft Policy Paper* 101-102; Paterson "An Incentive-Based Approach to Environmental Regulation" in *Environmental Compliance and Enforcement in South Africa* 333.
[407] National Treasury 2010 *Carbon Tax Discussion Document* 8-9. Although National Treasury does not advocate 'full earmarking' of specific revenue streams, it does support "'on-budget' earmarking of some revenue for specific (e.g. environmental or social) purposes … [where] appropriate to promote public and political acceptance of the benefits of the reform".
[408] The revenues from the Road Accident Fund levy flow directly into a ring-fenced fund, and are used to compensate the victims of road accidents.
[409] Paterson "An Incentive-Based Approach to Environmental Regulation" in *Environmental Compliance and Enforcement in South Africa* 334.
[410] *Ibid*.

felt by those at the lower end of the economic scale. However, environmental tax and the environmental fund have the potential to unfairly burden the poor, and mitigation measures may be necessary. Such measures have been considered in the context of carbon tax, and solutions suggested included personal income tax relief, in combination with or instead of higher transfers to poorer households in the form of effective and targeted roll-out of free basic services and block tariffs for both water and electricity.[411] Using the double dividends theory and tax shifting, by imposing environmental tax, the possibility exists to decrease the taxes on 'goods' such as labour and business, and in so doing decrease the pressure on the more vulnerable members of society.[412]

5.8 Competitiveness Impacts

It is clearly not in the country's best interests to undermine the ability of local industry to compete in domestic and foreign markets, and negative incentive-based tools risk doing just this.[413] Since the price mechanism inherently raises the cost of production, and therefore has the potential to negatively impact foreign competitiveness, this criterion must be carefully considered and research must be conducted into the extent to which this threat exists before a new MBI is introduced. Where such impacts on competiveness are deemed *ex ante* to be unacceptable, mitigation measures may need to be considered and introduced.[414] However, the environmental objectives sought to be achieved must be kept in mind, and the economy must be balanced with environmental concerns if true sustainable development is to be achieved. All of the five MBIs suggested for amendment or introduction are also already being used internationally, most in large jurisdictions which operate competitively. The need to remain competitive should therefore not be used as an excuse to avoid taking difficult or unpopular decisions, and the MBIs should be introduced despite a possible negative impact on competitiveness levels in the short term.

[411] National Treasury 2010 *Carbon Tax Discussion Paper* 39.
[412] Van Heerden *et al* 2006 *SAJEMS* 537-538.
[413] Paterson "An Incentive-Based Approach to Environmental Regulation" in *Environmental Compliance and Enforcement in South Africa* 334.
[414] National Treasury 2006 *Draft Policy Paper* 62-63.

Conclusion

In a country with a progressive environmental governance regime and the apparent political will to move away from the protection of the economy at the cost of the environment to an approach of environmental protection, it is a pity that mining still falls largely outside of the laws governing all other industries. However, vast progress has been made with the introduction of the MPRDA, and the National Treasury's actions in introducing numerous MBIs in other contexts bode well for the future of environmental protection in the mining sphere. There is still a long way to go, and several hurdles have been placed in the path of a smooth transition to more stringent environmental protection. The most pressing problem is the lack of action regard the AMD problem, and the vast drain of the State's resources caused by the abundance of ownerless and abandoned mines, and the resulting environmental degradation. However, several options for future growth in environmental protection in the mining context are put forward, and all of them are viable and can be accomplished if the political will is present.

It is argued in this dissertation that vast scope exists for the improvement of the existing MBIs in the mining regulatory framework – the performance bond and tax incentives – and that the introduction of some new forms of MBI found in foreign jurisdictions, or in other spheres of South African environmental regulation, would help to strengthen the regulation of mining.

In light of the pressing environmental problems of ownerless and abandoned mines and AMD, it is argued that an environmental fund dedicated to mining rehabilitation is perhaps the most important. This tool would stop the drain on the general fiscus, and would enable environmental authorities to carry out the much needed rehabilitation. This tool is also suitable for the perpetual nature of AMD management, since the fund can live on in perpetuity, long after individual mines have closed. In light of foreign examples it is suggested that a fund be created which is funded through environmental

taxes or direct contributions from mines, in order to create a more reliable and perpetual source of income to fund the rehabilitation of past and present mines in which the responsible party is either not traceable, or is unable to undertake this rehabilitation. This tool will need to be designed and legislated from scratch, since it cannot easily slot into any existing legislation, but statutory funds are not without precedent in South Africa. The fact that it will be newly drafted also allows for innovation and learning from foreign mistakes, and in light of the fact that we are seemingly following the US's approach to environmental funds, this suggestion bears a good chance of succeeding. The suggested model is that of the Abandoned Mine Reclamation Fund[415] in the US, which is funded through a levy on the coal which is mined, as well as other avenues, and which is made available to the State to rehabilitate mines which would otherwise be left derelict. Since the South African government is already in talks with the US on how best to proceed along the lines of their Superfund, it is suggested that this model be focused on and expertise and knowledge be gathered from the experience of the US.

The introduction of mitigation banking could ensure that biodiversity and ecosystems are conserved, and the use of tax incentives could further encourage positive environmental behavioural change and environmental conservation efforts. Since both of these tools are already in use in one form or another, the focus of their introduction into the mining rehabilitation context (or re-drafting, in the case of the tax incentive) will allow for specific targets to be met, and lessons to be learnt from the sectors in which these tools are already used. The mitigation banking is especially important in South African mining, since the rich biodiversity is threatened in many areas, and minerals only occur in set locations, which often coincide with threatened biodiversity. In these instances, mitigation banking seems like the only option in trying to conserve the biodiversity, short of banning mining in vast areas of the country. It is therefore imperative that this tool be introduced and utilised widely, and that the system be properly managed and monitored.

[415] Established by section 401 of the SMCRA.

The introduction of environmental tax is important in and of itself, in order to achieve specified environmental objectives, but is also necessary in one model of funding the environmental fund. It is therefore important that the framework for environmental tax which is already in place be expanded, and that the design of this tool be integrated into the other MBIs which should be introduced in the future.

Finally, the main MBI currently in use – the performance bond – can be improved dramatically through the implementation of lessons learnt from the US and Canada. The determination of quantum by the state rather than the applicant, the holding of the funds by the state (rather than the placement of such revenue in private trust funds), and the increased oversight, are all elements which would strengthen the current situation in South Africa and would lead to a more effective tool. Several weaknesses are addressed above, including concerns around vulnerability to the insolvency of mines, the lack of updated formulas to determine quantum, and the failure to properly account for the cost of rehabilitation. These issues need to be addressed urgently by the legislature, in light of the importance of this MBI, and buy-in must be achieved from the mining industry itself.

In summary, South Africa's mining legacy would appear to be a superfund sized problem rather than a trust fund baby. However, several possibilities exist for improving the situation through the introduction of an environmental fund, in conjunction with other MBIs, and the potential exists to solve many of the weaknesses of the current regulatory system.

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