



# The puzzle of media and sector legislation: putting the pieces together to create the legal picture for the mining industry

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## Introduction

This paper is based on the assumption of some knowledge of the National Water Act. It will consider the question of how that Act fits in with:

- a) existing laws which overlap on the subject matter
- b) new laws either in draft or in the process of being compiled
- c) policies which will eventually find their provisions included in new legislation (e.g. minerals policy)
- d) international practices.

The focus will be specifically on the interaction of legislation relating to water use and water pollution in the mining sector as well as the role of the Department of Water Affairs in mining matters. Hence the title of the presentation.

## Media and sector legislation

The first step is to explain what is meant by media and sector legislation. Legislation may be framed to address a specific sector like mining, energy, agriculture or tourism. Or, as has happened particularly in the development of environmental legislation it may be framed particularly to address and protect a specific medium e.g. water, air or land. For example, we have a National Water Act which makes provision for the protection of water resources, an Act dealing with air quality—the Atmospheric Pollution Prevention Act and the Environment Conservation Act which protects and conserves natural environments.

What has happened in South Africa since 1994 is that numerous new policies have been developed some of which have affected mining. The policies are drawn up by the Ministries that are charged with responsibility over a particular sector. So in the last few years we have seen new policies drafted in the form of White Papers on issues as diverse as water, local government, health, education, and the most recent to emerge, mining. Evolving from the various policies will be legislation to give effect to the principles outlined in the White Papers and so we have

also seen a proliferation of new legislation in the past few years which will continue as new policies are developed.

The difficulty with legislation which is developed in this way is that unless the drafters of the policies and legislation are aware of practices and developments in other areas and can co-ordinate with them, the policies and legislation will focus solely on the subject matter without taking into account other policies or legislation which may also impact on a particular subject matter. This has happened to a certain extent in the recent legislative developments which particularly affect the mining sector. This paper attempts to identify some of the issues to unravel the legislative requirements. However, to understand why some apparent conflicts between mining and other interests are emerging, it is important to know some background to mining legislation.

## Background

Historically the position of the mining sector has been a favoured one. The government was supportive of mining as it contributed so enormously to the GDP. To entrench the position, safeguards were built in to the prevailing legislation to ensure that mining would not be restricted by conflicting interests. So, if one looks at e.g. land planning legislation like the Physical Planning Act of 1967, land required for prospecting and mining was specifically excluded from the ambit of the Act. In the old Water Act of 1956 which dealt with the use of water on proclaimed mining land. It provided that nothing contained in that Act would be construed as derogating from any powers or jurisdiction conferred upon the Minister of

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Mines or any mining commissioner by any law relating to mining for precious or base metals or precious stones. Effectively, this placed water required for mining purposes on proclaimed land in a superior position to other water uses on that land. Under the Environment Conservation Act, regulations that identified waste excluded mining waste.

### Current position

What is now happening is that other priorities have been identified and the mining sector will be required to compete on an equal legal footing with other interests which may be of greater or less importance when it comes to demands placed on the use of the country's resources whether it be water, land or minerals themselves. The playing fields have been levelled.

### Water legislation

#### **National Water Act 36 of 1998**

The main media legislation dealing with our water resources is now the National Water Act. Although the Water Act is repealed in terms of this Act, certain provisions have been expressly excluded from the repeal and will continue to be of full force and effect. The Proclamation<sup>1</sup> which brought the new Act into operation effective from 1 October 98 preserved certain sections of the old Water Act of 1956. Only the following sections of the Act have not yet commenced operation—Sections 33, 37, 38, 40, 41, 42, 56, 57, 58, 59 and 60. Mention will be made of some of these preserved sections.

#### **Use of water by mines**

Owing to the fact that water is such an important and scarce resource, the use of all water in the broadest possible sense, has now been placed squarely within the responsibility of the Department of Water Affairs and Forestry (DWAf). As all uses of water are to be controlled by DWAf the use by mines of water and discharges of effluent will equally be controlled. In the past, water may have been obtained by a mine directly from source e.g. from a nearby river or from underground sources by dewatering or boreholes on the mine or from a local water board or municipal supply. Different provisions governed what permissions were required for the use of the water obtained from these different sources because of the distinction drawn between public and private water. Unless the mine fell within a subterranean water control area, underground water was regarded as private water and the use of such water was not controlled by the DWAf. For industrial water use<sup>2</sup> a permit was required to use in excess of 150 cubic metres a day. Effluent water may have been discharged into evaporation ponds or reused in the process or treated and returned to source. Similarly different provisions determined what was required for the different discharges.

Section 21 of the Water Act required that effluent produced from industrial processes must be treated to certain specified standards, failing which an exemption must be obtained. This section i.e. section 21 is one of the sections specifically preserved by the Proclamation. No exemption is required to discharge effluent if the effluent is purified by a

local authority or other approved authority. Treatment of the water was necessary if no exemption could be obtained. The current promulgated standards are known as the general standard, the special standard for phosphate and the special standard<sup>3</sup>.

It is made clear in the new Act that water required for industrial purposes will only be available if the demands of the ecological reserve and basic human needs have been met and water is available for such use. Where the water is to be supplied by a water services provider the provisions of section 6 of the Water Services Act will also apply. This point is covered in detail later.

In terms of section 12B of the Water Act, the owner of a mine where mining operations are lawfully pursued, may use underground water found within the mine subject to sections 12 and 21. Such an owner may use, sell, give away or dispose of such water only under a permit from the Minister of Water Affairs and subject to the conditions specified therein. This section i.e. 12B has been preserved by the Proclamation. However, once the National Water Act is fully operational no priority will exist for mines to remove and use underground water and a specific licence will have to be obtained in the absence of a general authorization permitting such dewatering.

As indicated earlier, because of the broad definition of 'use' of water in the Act, any number of uses of water in mining activities would now need to be licensed. The burden on the relevant authorities would be enormous and it has been proposed by the DWAf to make provision for general authorizations to be granted which would allow certain uses in certain specific areas and sectors to be carried out without a licence but under a general authorization subject to certain conditions. Draft proposals have already been put forward by DWAf for general authorizations for water use in the mining sector aimed at the protection of water resources. This would allow, for example, the disposal of effluent by mines to be authorized under a general authorization. This would clearly alleviate the burden on the relevant water authorities. The intention is that these general authorizations will be in place for a limited period (5 years). The draft general authorizations deal with the storing of water on the premises of a mine, impeding or diverting the flow in a watercourse, altering the course and character of a water course, discharging waste or water containing waste into a water resource and removing/disposing of water found underground.

Section 23 was the main penal provision of the old Water Act. It contained a very broad and over-arching concept, viz that no person may pollute water wilfully or negligently. 'Negligently' meant without reasonable care or foresight and one was required to take reasonable steps to avert any harm. This section has not been preserved by the Proclamation but the new Act also makes it an offence to pollute water.

Resource quality objectives will be established for a water resource of the geographical area concerned and no

<sup>1</sup>R6298

<sup>2</sup>Section 12

<sup>3</sup>Government Notice 991 of 18 May 1984. The special standard is only applicable to certain specified catchments which catchments are listed in Schedule 1 to the Regulations.

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allocations will be made which may impact on the resource quality objectives for that area. The disposing of waste in a manner that may detrimentally impact on a water resource also constitutes a water use in terms of the Act and a licence would be required in the absence of a general authorization.

The Act indicates that in order to establish the impact of a proposed allocation of water it may be necessary for an assessment to be done of what the impact will be on the quality of the water resource<sup>4</sup>. There is provision both in the Minerals Act<sup>5</sup> and in regulations to the Environment Conservation Act<sup>6</sup> for Environmental Impact Assessments (EIAs) to be done in certain circumstances and in these respective cases the relevant authority which would consider the EIA is the Department of Minerals and Energy (DME) and the Department of Environmental Affairs and Tourism (DEAT). Therefore there may, in the absence of proper co-ordination between these Departments, be three separately required EIAs affecting a mining project and approval from three different Ministries.

DWAF a few years ago prepared a policy and strategy document for management of water quality regarding the mining industry in South Africa. The motivation for the development of this document was to develop a sector specific management strategy for prospecting and mining. The document acknowledged that diffuse source pollution is one of the more significant threats associated with mining and that the regulatory system as it was could not readily control the threat alone. For this reason the strategy was to address shortcomings in the regulatory system. A sectoral source-based approach was therefore adopted. The regulatory tactics to be developed included:

- ▶ Upfront involvement in impact management measures in the Environmental Management Programme (EMP)
- ▶ Developing best practice guidelines for waste reduction, recycling and treatment and disposal of waste in the mining industry
- ▶ Involvement in ongoing environmental management
- ▶ Involvement in developing and approving closure plans
- ▶ Setting requirements for financial provision for mine rehabilitation
- ▶ Developing minimum requirement regulations to prevent water pollution during mining operations. In fact many of these tactics have started to happen and it is important not to lose sight of the benefits of adopting a sectoral approach to control. DWAF also prepared a series of documents giving operational guidelines as to applications under the relevant sections e.g. s21 and s12B<sup>7</sup>.

### **Regulations for water control during ongoing mining operations**

We understand that one of the first sets of regulations that will be promulgated under the National Water Act is the revamped version of Regulation 287. Many of you will be familiar with Regulation 287<sup>8</sup> which relates to measures aimed at the prevention of water pollution resulting from mining and related activities. The revamped version was first published as Regulation 1571 of 28 November 1997 in draft for comment and will have to be promulgated again under the new Act. An attempt was made in this draft regulation to co-ordinate with the Minerals Act requirements in that it

acknowledges the role of the EMP. Various duties are placed on the person in control of a mine similar to Regulation 287. There is a duty to notify the Director-General DWAF of any pollution incident. Duties are imposed as to where one may locate residue deposits, dams or structures and where mining can take place, and a duty to separate clean and dirty water on the mine. All of these controls are imposed with a view to protecting water resources. What should happen is for the duties imposed under this regulation to be translated into obligations in the EMP.

### **Water Services Act 108 of 1997**

To understand the implications of the Water Services Act which came into operation in December 1997, it is important to understand what is happening to the country generally insofar as local governance is concerned. Accordingly, the issue of local government is dealt with first and then a consideration of the effects of the Water Services Act. Many mines owing to their remoteness, fell outside the jurisdiction of any local authority and were not bound by local authority by-laws or demands for water or power supply. The Constitution has now entrenched the three tiers of government—national, provincial and local. Chapter 7 of the Constitution which deals with local government<sup>9</sup> requires that local spheres of government must be established for the whole of the territory of the Republic. All parts of SA will be incorporated into local authorities. As regards water and sanitation services (limited to potable water supply systems and domestic waste water and sewage disposal systems), national and provincial governments have the concurrent competence to legislate on these powers and functions, and the executive authority must ensure that municipalities perform these functions adequately. As it is the stated intention of government that all of South Africa should have three tiers of government, all mines will now fall within a local government area of jurisdiction and will be subject to Land Development. Objectives drawn up by such authorities as well as be bound under any local by-laws. Once LDOs have been established the land use is controlled and any development application inconsistent with the LDO will not be approved<sup>10</sup>.

The Water Services Act provides for, *inter alia* the rights of access to basic water supply. Potable water supply services from a source other than from the local authority or its nominated water services provider is not permitted without the approval of the local authority<sup>11</sup>. Existing rights to use water services from another source may continue until the user is called upon by the local authority to obtain approval. If approval is not given these rights will lapse. Water for industrial (this includes mining) use and effluent is also dealt with in this Act<sup>12</sup>. It provides that no person may obtain water for industrial use from any source other than

<sup>4</sup>s41 (2)

<sup>5</sup>s39

<sup>6</sup>R1182

<sup>7</sup>M-subseries M1.0-M1.4

<sup>8</sup>dated 20 February 1976

<sup>9</sup>Section 151

<sup>10</sup>Chapter IV of Department Facilitation Act 67 of 1995

<sup>11</sup>Section 6

<sup>12</sup>Section 7

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the distribution system of a water services provider nominated by the water services authority having jurisdiction in the area in question, without the approval of that water services authority. The industrial use of water is defined to include *inter alia* the use of water for mining. A 'water services provider' is defined as any person who provides water services to customers or to another water services institution, which includes a Water Board. A 'water services authority' is defined as any municipality, including a district or rural council as defined in the Local Government Transition Act, responsible for ensuring access to water services. If the applicable water services provider is not nominated by the water services authority which has jurisdiction in the area then such an approval will need to be sought. The local authority thus has a say over the source of water to be used for an industrial purpose whether the water is potable or not.

Similarly, the duly nominated water services provider must approve the manner of disposal of industrial effluent. Existing uses and disposals may, however, continue until the user is called upon by the water services authority to obtain approval. Appeal mechanisms are provided for in the case of an unfair handling of this process<sup>13</sup>.

Under this Act the local authority was required within one year of its commencement i.e. by December 1998, to prepare draft water services development plans which are required to establish a baseline study of the area involved, detail an implementation programme for the following five years and include information as to existing industrial use and future provision of water for industrial use. There is, therefore, a need for mines to work closely with the local authority on the question of water services and supply in order to ensure that a mine's particular water needs are taken into account in the development of these plans.

Other laws which give powers to local authorities will apply to mines unless specifically excluded. The Health Act for example which provides<sup>14</sup> for every local authority to take all lawful, necessary and reasonably practicable measures, *inter alia* to prevent the pollution of any water intended for the use of the inhabitants of its district, irrespective of whether such water is obtained from sources within or outside its district, or to purify such water which has become so polluted.

Another example is the Local Government Ordinance 17 of 1939 of Gauteng<sup>15</sup> which deals with by-law powers, provides that the council may from time to time make, alter, and revoke by-laws for all or any of the following purposes, namely:

- ▶ for regulating the supply and distribution of any water under the control or management of the council, for making charges for the use of water from water-furrows, and for compelling owners or occupiers to maintain in good order water-furrows traversing or abutting on their premises
- ▶ for preventing the waste, undue consumption, misuse, or contamination of such water and for prescribing the size, nature, materials, workmanship and strength and the mode of arrangement, connection, disconnection, alteration and repair of pipes, meters, cocks, ferrules, valves, soil-pans, waterclosets, baths, cisterns and other apparatus to be used and for forbidding any

arrangements and the use of any water-fitting which may allow or tend to waste, undue consumption, misuse, erroneous measurements or contamination

- ▶ for preventing the pollution of any water which the inhabitants have a right to use
- ▶ for preventing the pollution of catchment areas, rivers, canals, springs, wells, reservoirs, filter beds, water purification or pumping works, tanks, cisterns or other sources of water supply or storage of the water wherein or wherefrom is used or is likely to be used by man within the municipality for drinking or domestic purposes<sup>16</sup>.

These are duties which are imposed on the local authority independently of the National Water Act but at the same time over an media i.e. water for which the DWAF has custodianship. Under the National Water Act management of water resources is intended to be handled by the Water Catchment Agency and it remains to be seen how the apparently conflicting responsibilities will be sorted out.

### Common law

Besides the statutory requirements, at common law duties relating to protecting water resources are also imposed on mines. These arise directly from common law principles of delict. The fact that a mine is in compliance with statutory obligations does not relieve it of its common law obligations. A case involved the producer of effluent who was discharging it from his factory into a public stream<sup>17</sup>. Where the effluent discharged into the stream pollutes it both in the sense that it does not conform to the standards laid down in terms of the statute and in the sense that it amounts to pollution at common law, an injured third party may elect whether to proceed against the offender for breach of the statutory duties laid upon him by sections 21 (1) and (2) or under the common law. The producer was found to owe a common law duty of care towards others. He was relieved of the statutory obligations imposed upon him by section 21 (1) and (2) but no more than that. If section 21 (3) is applicable, the injured party may no longer proceed against the producer for failing to perform the statutory duties of which he has been relieved, but he may still proceed against him for an interdict under the common law.

### Water pricing policy

A third draft of the National Water Pricing Strategy for Water Use Charges as contemplated by the National Water Act (dated 3 September 1998), is available for comment, and many stakeholders (including business and industry) have provided DWAF with their comments on the document. The document has been criticized for internal inconsistencies and some of its principles have also been criticized. It is hoped that these comments will be properly considered and incorporated into the final draft of the Strategy, which is

<sup>13</sup>Section 8

<sup>14</sup>Section 20

<sup>15</sup>Section 80

<sup>16</sup>Section 80 (35)-(38)

<sup>17</sup>*Rainbow Chicken Farm (Pty) Ltd v Mediterranean Woollen Mills (Pty) Ltd 1963 (1) SA 201 (N)*

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expected in November 1998.

The Water Pricing Strategy which has been ongoing for a number of years deals with the pricing of the use of water from South Africa's water resources and not with the pricing of water supply services, which have been dealt with under the Water Services Act No 108 of 1997. It deals with first tier water (i.e. the actual resource) rather than with second and third tier water (i.e. water supplied in bulk and distributed to households usually through Water Boards or municipalities). The Strategy will therefore cover state and private schemes as well as ground and surface water resources.

The latest draft Strategy sets out the factors that influence the supply and demand for water in South Africa and states that demand-side management mechanisms will be focused on, although supply-side initiatives will not be neglected. The principles that will shape the new Pricing Strategy are:

- social equity
- ecological sustainability
- financial viability and
- economic efficiency.

Only the economic use of water will be subject to pricing i.e. that water which is left over after the basic human needs, ecological requirements and international obligations for a particular catchment have been determined and allocated. The Pricing Strategy for the economic use of water may differentiate between different types of geographic areas, different categories of water use and different water users.

The long-term objective is to specify how each water use, as contemplated in the National Water Act will be priced and charged for. The pricing strategy will, however, evolve over time and at the outset only the most significant water uses will be priced. Initially the pricing strategy will therefore include only those water uses that can be expressed in volumetric terms in regard to annual quantities consumed, moved or discharged.

The taking and storing of water will be quantified in volumetric terms, including estimated evaporation losses from the water surfaces of dams. The discharge of waste or water containing waste will be priced in terms of the volumetric quantification of the discharge of water containing waste into a water resource. The use of underground water and the dewatering of mines will also be included in the pricing strategy. Underground water removed for mining purposes and discharged into a water resource, as directed by DWAF, will not be subject to pricing for the quantity of water removed, however, waste discharge charges may be applicable. The charges will be based on the volumetric use for the initial filling of the impoundment and the estimated annual evaporation from the dam surface. Other water uses such as controlled activities, the disposing of waste in a manner which may detrimentally impact on a water resource and altering the bed, banks, course or characteristics of a watercourse will not be included in the initial pricing strategy.

Water pricing strategies may set water use charges for funding water resource management, for funding water resource development and the use of water works, and for achieving the equitable and efficient allocation of water. The distinction between these three areas is used as the basis for

the determination of water use charges. The Strategy will set out how these funds may be used in each of the three areas. An indication is provided as to how the charges will be implemented for each of these three areas. It may be necessary to introduce economic instruments in order to optimize the allocation of scarce resources between competing uses. Any such economic charges would be additional charges over and above the financial charges for water resource management and water resource development. These economic instruments would probably only be introduced in water stressed areas and reference is made to the possible application of administrative measures, public auctions and water markets.

It is stressed that the first two areas reflect financial costs whereas a charge for achieving the equitable and efficient allocation of water would be an economic cost, as these charges would aim to provide incentives to manage demands on the resource. Economic pricing will however only be implemented once the full effect of the financial costing of water on resource utilization has been evaluated.

Waste discharge charges will be phased in but should ultimately generate enough funds to finance the existing water pollution control and water quality management functions in the regional offices that relate to point and diffuse sources of pollution. In summary, the full financial cost of first tier water will eventually be recovered from water users. In some water stressed areas the full financial charge may be supplemented by an economic charge. The implementation of the Strategy will therefore significantly increase the costs payable by business and industry for the defined uses of water.

### **Wetlands Conservation Bill**

A Wetlands Conservation Bill was tabled in Parliament a few years ago as a private member's Bill. It was then put on hold to give the Department an opportunity for consultation. The Bill has still to go through the political process of approval. Certain amendments have been made to the first draft as published, but the path and progress of the bill is not clear. The Bill is intended to give effect to the Ramsar Convention on Wetlands of International Importance especially as Waterfowl Habitat. It also places a prohibition on prospecting or mining in listed wetlands (i.e. a wetland listed in the Convention). In addition, it provides for the Minister by notice in the Gazette to prohibit *any activity in any wetland or listed wetland which in his or her opinion is likely to affect adversely the ecological character of such wetland or listed wetland*. The Minister in this case is the Minister of Environmental Affairs and Tourism. He may grant a conditional permission to carry on the proposed mining activity which may be withdrawn if the condition is breached. It is not clear how this proposed legislation would fit in with the Minerals Act and the powers of the mining authorities. The Bill goes on to provide that the Minister may prohibit activities detrimental to catchment areas which may impact on wetlands. Once such an activity has been designated by the Minister no person may carry on the activity without the written authority of the Minister.

There would have to be integration of this proposed legislation into the water reform process and land development process. It is important to be aware of the

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proposed legislation as an indication of the attitude of the authorities towards the possibility of mining in a wetland.

### Mining legislation

#### *Minerals Act 50 of 1991*

The Minerals Act is obviously the major sector legislation which determines how one goes about conducting mining operations lawfully. For a person who wishes to start or continue a mining enterprise, this Act would be the point of departure BUT it is certainly not the only legislation which must be complied with and the DME is certainly not the only department in practice which has a say over how the mining operations will be conducted.

Section 9 deals with the issuing of a mining authorization which, if granted, allows the applicant to mine for and dispose of a mineral. In terms of section 9 of the Minerals Act, before issuing the mining authorization, the Director: Mineral Development must satisfy himself, *inter alia* on the manner in which such applicant intends to rehabilitate disturbances of the surface which may be caused by its mining operations, and the applicant's ability to make the necessary provision to mine optimally and to rehabilitate disturbances of the surface. Mining activities by their very nature impact upon natural resources including water resources. To cater for these impacts, as we all know an approved environmental management programme (EMP) as provided for in section 39 is required before mining may commence. This determines what must be done as regards, *inter alia*, water resources affected by mining. The Act requires that before the Director: Mineral Development approves any EMP or grants any exemption or extension of time or any temporary authorization he or she is required to consult, *inter alia*, with each department charged with the administration of any law which relates to any matter affecting the environment. This obviously includes consulting with DWAF. The nature of such 'consultation' has been bedevilled by what is meant by the word 'consult'—is it simply to advise or must consensus be reached? DWAF is given the opportunity to impose obligations on the mining proponent which must be carried out in terms of the EMP. If DWAF were of the view that mining should not take place at all as the threat to a water resource was too great the Act does not indicate what would happen and the required 'consultation' could result in the DME overriding DWAF. (In view of the provisions of the new minerals White Paper it would now seem that in these circumstances mining could in fact be prevented—this point is considered later under Minerals policy.) A new draft regulation was recently published which makes provision for the assessment of EMPs on an ongoing basis. This will go some way to validating the role that can be played by the EMP process in managing environmental issues.

Other sections of the Act impose obligations with regard to water e.g.<sup>18</sup> the Director: Mineral Development may issue directives and determine conditions in relation to the use of the surface of land comprising the subject of any prospecting permit or mining authorization or upon which a works is situated in order to limit any *damage* to or the disturbance of the surface, vegetation, environment or *water sources* to the minimum which is necessary for any prospecting or mining operations or processing of any mineral. Such directives and

conditions must not be construed as placing the holder of any such prospecting permit or mining authorization or the owner of such works, as the case may be, in a better position *vis-à-vis* the owner of such land in relation to the use of the surface thereof.

Legislation which predated the Minerals Act made provision for water rights to be obtained together with mining rights. These rights to use water or the surface of land granted earlier are perpetuated in the Minerals Act. The Minister of Minerals and Energy is also empowered<sup>19</sup> to make regulations regarding *inter alia*,

- ▶ the conditions on which equipment, structures, surface of land and water sources may be undermined, the prohibition on or restriction of the erection of equipment and structures and the use of the surface of land and water sources in the vicinity of the working places of a mine
- ▶ the protection of equipment, structures, the surface of land and water sources and the making safe of undermined ground and of dangerous excavations, tailings, waste dumps, ash dumps and structures, of whatever nature, made in the course of prospecting or mining operations or which are connected therewith, the imposition of monetary and other obligations in connection with such safe-making on persons who are or were responsible for the undermining of such ground or the making of such excavations, tailings, waste dumps, ash dumps or structures or for the dangerous condition thereof, or who will benefit from such safe-making, and the assumption by the State of responsibility or co-responsibility for such safe-making in particular cases
- ▶ the conservation of the environment at or in the vicinity of any mine or works
- ▶ the management of the impact of any mining operations on the environment at or in the vicinity of any mine or works
- ▶ the rehabilitation of disturbances of the surface of land where such disturbances are connected to prospecting or mining operations
- ▶ the prevention, control and combating of pollution of the air, land, sea or other water, including ground water, where such pollution is connected to prospecting or mining operations
- ▶ pecuniary provision by the holder of a prospecting permit or mining authorization for the carrying out of an environmental management programme
- ▶ the assumption by the State of responsibility or co-responsibility for obligations originating from regulations made under this paragraph
- ▶ the monitoring and auditing of environmental management programmes.

Similarly the Regulations under the old Mines & Works Act which now form part of the Regulations under the Minerals Act also impose certain obligations e.g. when the operations at any mine or portions thereof, are discontinued and such mine or portion is abandoned, the owner or the

<sup>18</sup>Section 41

<sup>19</sup>Section 63

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person acting as manager of such mine at the time of such discontinuance/abandonment, continues to be responsible for compliance with the provisions of the Regulations until the Director: Mineral Development in consultation with the *Director-General of the Department of Water Affairs*, has issued to him a closure certificate (i.e. that such provisions have been complied with). Thus before a mine can be closed there has to be consultation with DWAF.

Water containing poisonous or injurious matter in suspension or solution must be effectually fenced off to prevent inadvertent access to it, and notice boards must be put up in suitable places to warn persons from making use of such water. Water containing any injurious matter in suspension or solution may not be permitted to escape without having been previously rendered innocuous<sup>20</sup>. In a recent case<sup>21</sup> involving mining where the escape of water containing injurious matter occurred from a mine, it was found that this regulation was enacted for the benefit of owners of land which might be polluted by actions of the mining company. The Legislature had intended to provide a civil remedy for damages caused by breach of the regulation. The judge concluded that the regulation does not impose a standard of care but imposes a duty in absolute terms. The duty infers that those who have suffered as a consequence of a failure to comply with such duty should be entitled to compensation. The regulation clearly was intended to place both the duty to prevent the escape of noxious water arising from mining operations and the risk of damage caused by such water on the persons responsible for and benefiting from the mining operation. The civil remedy for damage caused by a breach of the regulation extended beyond a mere interdict. Other Regulations impose obligations concerning water located within the mine and steps to be taken to prevent flooding etc.

Clearly there is an overlap in the functions which can be regulated by the Minister here and functions that should be regulated by the DWAF. Clarity would be needed to indicate which Department has responsibility for these issues.

### Environmental legislation

#### **Environment Conservation Act 73 of 1989 (ECA)**

In terms of the Constitution provincial and local laws cannot conflict with the national law. An environmental policy was determined by the Minister under the ECA<sup>22</sup>. Every other Department and competent authority must exercise its powers insofar as they may influence the environment, in accordance with the policy. It is therefore necessary for the mining authorities to comply with the policy, as even the DME should exercise its powers in accordance with the policy, and may not therefore grant authorizations or other approvals which would lead to non-compliance with the policy. The judicious use of land is mentioned in the policy as an important foundation of environmental management. All government institutions, and also private owners and developers, must therefore plan all physical activities, for example forestry, mining, road building, water storage and supply, agriculture, industrial activities and urban development in such a way as to minimize the harmful impact on the environment and on man and, where

necessary, to facilitate rehabilitation. A balance must be maintained between environmental conservation and essential development. In order to attain the sustainable utilization of resources, the principles of integrated environmental management are accepted as one of the management mechanisms. In that part of the policy dealing with land use it states that particular efforts must be made, *inter alia*, to prevent the destruction of wetlands and other environmentally sensitive areas.

A new environmental policy was developed which was published in the White Paper on Environmental Management Policy for South Africa<sup>23</sup>. The principles identified in the document are commendable and were a result of an extensive consultative process. Unfortunately the draft legislation which has flowed from the White Paper is not as commendable. This point is covered under the Environmental Management Bill.

#### **EIA regulations**

ECA provides for the identification of activities which will probably have a detrimental effect on environment<sup>24</sup>. The Minister can (and has) by notice in the Gazette identified those activities which in his opinion may have a substantial detrimental effect on the environment, whether in general or in respect of certain areas. The Section goes on to provide that such activities may include any activity relating to water use and disposal. This effectively puts in the hands of the Minister of Environment Affairs the right to require EIAs where water use and disposal is concerned. The ECA provides that no person may undertake an identified activity (an activity which is likely to have a detrimental effect on the environment) without written authorization to do so<sup>25</sup>. Regulations were published under the ECA<sup>26</sup>, identifying activities that may have a substantial detrimental effect on the environment and setting out the procedures and requirements to be followed in regard to such activities. The regulations also include a number of activities relating to water. The regulations are commonly referred to as 'the EIA regulations' as they require that a full environmental impact assessment be conducted in certain circumstances before the authorization to commence a listed activity may be granted. No identified activity can be undertaken without a written authority from the Minister. Where a mining project is being proposed, the project proponent is not strictly required to comply with the EIA Regulations, since mining and mining-related activities have been specifically excluded from the list of 'identified activities' for which one would require an Environmental Impact Assessment Report. However, as mentioned earlier there are provisions under the National Water Act which require an assessment and the Minerals Act<sup>27</sup> enables the Director: Mineral Development to decide whether to call for an EIA. There is at present no clarity from

<sup>20</sup>Regulation 5.9

<sup>21</sup>*Lascon Properties (Pty) Ltd v Wadeville Investment Co (Pty) Ltd and Another 1997 (4) SA 578 (W)*

<sup>22</sup>declared in GN 51 of 1994

<sup>23</sup>published in May 1998

<sup>24</sup>Section 21

<sup>25</sup>Section 22

<sup>26</sup>Regulation 18261 on 5 September 1997

<sup>27</sup>Section 39 (5)

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the various departments as to whether an Environmental Impact Assessment Report is required where an activity forms a component of the proposed mining operation and is also included on the list of 'identified activities' in the regulations. This issue is still being debated by the DEAT and the DME. The potential environmental impacts of, for example a flood protection levee at a proposed mine (which is included in the list of 'identified activities') could well require an EIA to be done, in order to fully comply with the Regulations. To further complicate the issue the EIA needs to be submitted in the normal course to the provincial department of Environment Affairs. This again highlights the importance of the co-ordination required both inter-departmentally and as between provincial government and regional offices of DWAF and DME.

### **National Environmental Management Bill**

This Bill is intended to give effect to the White Paper on an Environmental Management Policy mentioned earlier and should be seen as part of the overall environmental law reform process. However, the Bill in some cases ignores processes already under way which impact on the environment, e.g. the Integrated Pollution and Waste Management policy and the Integrated Environmental Management process and in others does not recognize or integrate with existing legislative provisions, e.g. as regards the Environment Conservation Act. It also does not reflect in some instances the provisions of the White Paper.

The Bill is intended to provide a framework for integrating good environmental management into all development activities and promote certainty with regard to decision-making by State organs on matters affecting the environment. It establishes a lead co-ordinating role for the Department of Environmental Affairs and Tourism. The Bill provides for '*best practicable environmental option*'—*the option that provides for the most benefit and causes the least damage to the environment as a whole* as the test for integrated environmental management. Pollution is defined to mean any change in the environment caused by substances, noise, odour, dust or heat emitting from any activities where the change has an adverse effect on human health. Chapter 1 emphasises in the principles that development must be environmentally, socially and economically sustainable. Chapter 3 imposes procedures for co-operative governance. Every national department which exercises functions which may affect the environment and which is listed a Schedule to the Bill, as well as every province, must prepare an environmental implementation plan within 1 year of the promulgation of the Act and at least every 4 years thereafter. Every national department listed in Schedule 2 to the Bill, i.e. that exercises functions involving the management of the environment, must prepare an environmental management plan within 1 year of the Act being promulgated and at least every 4 years thereafter. These environmental implementation plans and management plans are intended to promote the co-ordination of environmental functions and the implementation of obligations within the government. Since one of the principal concerns which industry has expressed in regard to the administration of environmental laws has been the lack of co-ordination and clear allocation of responsibility between the various govern-

mental departments administering environmental laws, the objectives in this chapter of the Bill have been supported. It is, however, feared that the procedures suggested in Chapter 3 will not adequately address these problems and may, in fact, lead to further confusion due to the lack of capacity in the various departments to prepare and then implement the proposed implementation and management plans. It is possible that the implementation and management plans will provide industry with clearer guidelines in that every organ of state is required to exercise every function it may have substantially in accordance with the environmental implementation plan or management plan prepared, submitted and adopted by that organ of state. The plans, reports and agreements will be available for inspection by the public. The importance of and need for this co-ordinating function is evident from this paper. It seems that the essence of the co-ordination will be in the memoranda of understanding which will be entered into between the various departments. Chapter 5 of the Bill deals with integrated environmental management and section 24 provides for the formulation of Environmental Impact Assessments for identified activities. Chapter 7 deals with the enforcement provisions and section 28 imposes a duty of care on every person who causes or may cause significant pollution or environmental degradation, to take reasonable measures to prevent such pollution from occurring. This Bill should make it clear how proposed mining activities will be handled insofar as the management of the environmental impacts are concerned. The details of how the various departments will co-ordinate their activities have still to be finalized but it is clear that the principles that will guide the relevant department will be those as set out in the Bill.

The role to be played by interested and affected parties is also not clearly established. Whilst we all agree on the importance of such participation it must be in a structured form and this is also not provided for in the Bill. The role of interested and affected parties is catered for in the processes required in conducting an environmental impact assessment but the implications of the Bill and of the Minerals policy seem to take this further.

### **Policies**

#### ***Integrated pollution control and waste management***

A draft White Paper on Integrated Pollution and Waste Management for South Africa (a policy on pollution prevention, waste minimization, impact control and remediation) was published in August 1998. The draft White Paper sets out the policy which is a subsidiary policy of the overarching Environmental Management Policy for South Africa. The policy recognises the need for sustainable development and emphasises the integration of social, economic and environmental factors. The National Waste Management Strategy project ('NWMS') has flowed directly from the policy and from the Environmental Management Policy for South Africa. The focus and emphasis of the NWMS is primarily on solid and semi-solid waste and not on



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waste water and air pollution (although these are dealt with to some degree). The objective is to deal with the full cycle of waste, from generation to final disposal, in order to reduce waste and diminish its environmental impact so that the socio-economic development of South Africa, the health of the people and the quality of environmental resources are not adversely affected. The key water pollution issues which are identified in the White Paper are the following:

- Salinization of fresh waters
- Enrichment of fresh water bodies by plant nutrients
- Micro-biological quality of water
- Sediment and silt migration
- Harmful inorganic and organic compounds
- Defuse water pollution and
- Marine pollution.

The Department of Environmental Affairs and Tourism is acknowledged as the environmental lead agent. However, it is acknowledged that DWAF has a major role to play and that these two departments cannot act in isolation. It is stated that 'the current practice of issuing individual medium or activity permits will be altered to a system of multi-media authorizations, which will result in a single permit covering all aspects of integrated pollution and waste management'. It will be interesting to see how this principle is translated into legislation as it will have a dramatic effect on industry and mining. A co-ordinating committee will be established to ensure overall co-ordination. A consolidated set of requirements for applications, including impact assessments, will be prepared jointly by the relevant authorities in order to expedite the evaluation of applications. Standards will be set by the lead agent for environmental qualities (excluding water quality). These standards will define the maximum pollution and waste levels that a particular receiving environment can tolerate without significant deterioration. The standards will be set through a consultative process.

The National Waste Management Strategy Project (NWMS) was initiated in August 1997 and its short-term goals are to develop strategies, action plans and to increase capacity within both DEAT and DWAF that will lead to the establishment of effective integrated waste management.

The Waste Management Strategy is nearing completion and this Strategy will drive the new waste legislation which will cover all solid waste, emissions to air and noise. Mining waste which, as has been mentioned, was previously excluded from the definition of waste, will be covered by the Strategy in a separate and parallel strategy that will then be integrated into the overall waste management strategies. Mining waste was originally classified as hazardous waste, however, it has now been recognised that mining waste does consist of both general and hazardous waste and therefore a separate strategy has been initiated to examine and classify mining waste. The support for the concept that mining waste should be treated on a sector specific basis and that sector specific provisions should be put in place to deal with the problem of mining waste is to be welcomed. These provisions would be no more or less onerous than in dealing with other waste but would recognise the sector specific needs involved.

### **Minerals policy**

The section in the Green Paper on a Minerals Policy for South Africa dealing with environmental management confirmed

the need to promote sustainable development. It emphasized that mining must be conducted in an environmentally responsible way. Communities affected by mining should be enabled to participate in environmental impact assessment studies at the planning stage. It accepted the principle of multiple land use should be adhered to in planning decisions and contending options will be assessed on economic, social and environmental grounds. This was subject to the proviso that the decision process will give precedence to mining where it is justified, will accept the concept of sequential land use, and will take account of equity, economic efficiency and sustainability. This was not the final say on the matter but it did indicate the direction in which the Department of Minerals and Energy was moving. In the White Paper which was published in October 1998 the proposed new system for granting access to mineral rights, makes it clear in subparagraph (p) that the process of considering the granting of a prospecting and mining licence and the approval of the EMP are to run concurrently and will be granted simultaneously. Read together with Chapter 4 this indicates a significant departure from the current practice which leaves the decision making of whether to grant such a licence to the Director: Mineral Development. It is currently at the stage of consideration of the EMP that public participation is catered for. This was challenged in the recent case of SAVE v Sasol and the Director: Mineral Development (heard earlier this year and which is now on appeal). The judge concluded in that case that the *audi alterem partem* rule should apply at the time of the decision whether to grant the licence, and accordingly the mining licence issued to Sasol was revoked. In terms of the policy, public participation will be required before the decision whether to grant a licence or not is made. The combination of the two application requirements is to be welcomed although the concern is that if the public consultation process is not properly structured and controlled this may lead to no approvals being granted at all. At present there is insufficient provision in environmental legislation for structured public participation. As mentioned earlier the draft Environmental Management Bill which is meant to address this, fails miserably and creates even more confusion about when public inputs should be made. If public participation will be required at the stage of obtaining approval for an EIA this would be in line with international practice. However, once an EIA has been approved by the relevant authority, when the decision whether to grant the mining licence will be made and who will make the decision as well as a decision on the conditions under which such a licence is issued have not been addressed. It was hoped that the policy would provide further details in regard to the actual approval process and the nature, extent and procedures for public consultation, in other words, whether EIAs will be required and how they will link in with other approvals.

The policy makes specific reference to the fact that a 'no-go' option will be considered as part of the risk averse and cautionary approach to be adopted in decision making. The difficulty with a 'no-go' option in the case of mining is that there is maybe no alternative location—one is bound to mine where the mineral deposits are located. A 'no-go' option effectively sterilizes for future use the minerals which are the subject of the application. The policy does not address what the position of a mining company would be where it wishes to

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exploit privately held rights but is prevented from doing so because of perceived or actual environmental problems. Would the company be compensated for these sterilized assets?

Although the principle that the 'pollute pays' will be adopted it is possible that it may not be applied consistently. (The type of policing envisaged in existing and draft environmental legislation is for the State to be able to call on the offender to clean up. Failure to do so entitles the State to conduct the cleaning up and recover the costs from anyone who obtains a benefit from such clean up. It may then end up being the community who pick up the tab or those with the deepest pockets and not the polluter who pays.)

Chapter 4 leaves open the question of lead agency which has been a problematic issue in the environmental arena. Reference to the 'controlling authority' indicates that this question has not been settled as far as mining environmental issues are concerned. The debate over this point has been whether the DME should be both the promoter and regulator of mining activities, as there is a potential conflict of interests. It is stated in Chapter 4 that DEAT is the lead agent for environmental issues and that the DME will support the lead agent; however, Chapter 6 stipulates that the DME will be lead agent for governance of the minerals industry. Apart from indicating that co-operative governance (inadequately provided for in terms of the draft Environmental Management Bill) will be promoted, no clarity is provided as to actual areas of departmental responsibility and functions. The provisions of this policy will still have to be translated into a strategy and included in the law before effect can be given to them.

### International position

Obviously many of these problems are not unique to South Africa so a look at how other jurisdictions have come to terms with their problems is of interest. No governments are prepared to close their eyes to uncontrolled degradation as a necessary consequence of mining investments. This is so, even where the local economic factors support the investment. The international climate regulating environmental management in mining has evolved from a combination of international treaties, the influence of international lending agencies, precedents around the world and pressure from the environmental lobby groups. The focus is on how mining can be conducted in a sustainable way. Sustainable development in the mining sphere seems generally to have been accepted to mean that a transparent process is put in place whereby adequate revenues generated by the exploitation of a non-renewable resource are suitably invested to ensure the future development of a long-term sustainable livelihood for the members of the affected community. In part, this is not only a government function but also a mining one. A mining company needs to be able to answer the issue about exploitation of a non-renewable resource at an unacceptable environmental and social cost.

In Australia substantial areas of land have been closed off to mining or allow mining only on a restricted basis; this includes parks and nature areas as well as land protected for social and cultural reasons e.g. Aboriginal areas. Most states, mining laws provide that environmental factors should be considered in issuing the leases. All states have EIA

requirements. The initial decision whether an assessment is required rests with the minister responsible for the proposed development e.g. the mining minister in the case of a mine. The matter is then referred to the Department of Environment for a final determination. If an assessment is deemed necessary the mining minister consults with the environmental minister in its development. As regards pollution control the general pattern is to establish separate statutes for air and water pollution and waste disposal. The Minerals Council of Australia has developed a Code for Environmental Management, etc.

In Europe a Council Directive (the Environmental Assessment Directive) exists where the effects of certain public and private projects on the environment are assessed up-front. This includes projects in the 'extractive industry'. In the UK the major permit necessary to carry out mining operations is planning permission and applications for major mining projects must be accompanied by an environmental statement. The effect of EU directives in the UK will mean, insofar as environmentally sensitive areas are concerned, that a mining project may only proceed if the appropriate assessment shows that it will not adversely affect the integrity of the site. If the assessment shows that a negative effect on the nature conservation interest will result, the development may only be allowed if there are no alternative solutions and if there are imperative reasons of overriding public interest, including those of a social or economic nature. The Waste Framework Directive of the EU obliges member states to take the necessary measures to ensure that waste is recovered or disposed of without endangering human health; without processes which harm the environment; in particular without risk to water, air, soil, plants and animals. Permits are required for landfill operations. The list of wastes to be subject to control include waste resulting from exploration, mining, further treatment of minerals and quarrying. The public and interest groups are increasingly being given greater roles under European law. Under the EA Directive mentioned above the public must be given an opportunity to express an opinion before the project is initiated. The latest environmental programme of the Community seeks to take this even further in giving the public the right to participate as fully as possible in the decision-making process. Environmental law emanating from the EU is having a profound impact on mineral operators.

In the USA the use of land for mining is no longer automatically considered to be its highest use. Large areas of the public lands are not available for mineral exploitation and development. These include national parks, wilderness areas, etc. Mineral development on public lands are subject to control by the federal agency with management responsibility for these lands i.e. the equivalent of the Department of Lands. Mining developments on national forest lands requires the approval of the US Forest Service. State and local law may also affect mineral exploration and development on private lands. There is a trend in the US to simply preclude mining activities on certain lands because of their value for environmental purpose. In the US there is a great deal of media legislation i.e. laws aimed at protecting the different media like ambient air or water quality. The National Environmental Policy Act requires major federal actions to be subjected to an EIS. Permits define the degree and manner in

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which pollutants can be released from the mine into air, water and land.

To construct and operate a mine in the US the company will have to obtain a series of permits from federal and state agencies. The Clean Water Act subjects all discharges into waterways to a permit requirement. Pollutant concentrations in the discharges are specifically limited according to certain technological requirements. All solid and hazardous wastes must be managed in an environmentally safe manner. A regulatory programme for mining waste has been established.

The common international threads are that:

- ▶ Certain areas are excluded where of special environmental value
- ▶ EIA not in themselves decision documents but are intended to ensure that a full consideration is given to the environmental impacts of the decision
- ▶ Polluting activities into the various media are regulated by permits

### Conclusion

At present a proponent of a new mine as well as the operator of an existing mine has the incredibly difficult task of deciphering the often confusing and conflicting policy and legislation in the mining and environmental spheres to ascertain what is, in fact, required of him and which departments should be involved. Unless this is simplified and clarified the effect will be that mining operations will be hindered and delayed or may not proceed.

Once the Environmental Management Bill becomes an Act active steps must be taken by the various departments concerned to enter into a Memorandum of Understanding to co-ordinate between themselves the different roles. The effects of these Memoranda must be communicated as soon as possible to prospective and active mining companies to enable them to take the necessary actions to bring their operations into compliance or to start a new mining operation. ◆

## MassMin 2000\*

**Brisbane, Australia · 29 October–2 November 2000**

In 1981 the first of two International Conferences on Mass Mining Methods was held in Denver Colorado, USA and was hosted by the Society of Mining Engineers of AIME and its Mining & Exploration Division. This resulted in the publication of Conference proceedings; Design and operation of caving and Sub-level stoping mines edited by Dan Stewart. These proceedings have arguably become a practical and classic reference on Sub-level caving, Block caving and Panel caving mining methods. The areas addressed during this first conference were: Method selection; Block caving; Sub-level caving; Sub-level stoping; Equipment application; Material flow/draw control; and Ventilation.

The second conference on Mass Mining Methods was held ten years later in South Africa (MassMin 92) and was hosted by the South African Institute of Mining and Metallurgy. The mining areas were extended to include: Mine planning and design; Geotechnical and support; Mine infrastructure and access; Mining methods; Drilling and blasting; Production management; Selection and maintenance of equipment; and aspects of coal mining.

The interest in applying low cost mining methods continues to grow. This is evidenced by the increasing number of major mining firms worldwide exploring the feasibility of mining even deeper, stronger and otherwise uneconomic deposits using low cost, large scale underground methods. In many situations, the conventional design and mining methods for massive metalliferous orebodies are continually being challenged. This is particularly true given that some of the current demands; deeper

orebodies, stronger rock masses; high stress; and higher temperature environments are outside current experience.

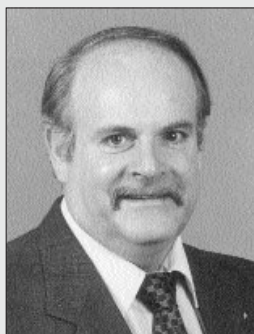
As we approach the next millennium it would appear plausible that the international mining community should once again assemble to discuss and share experiences, advances and future challenges in the mining of massive metalliferous orebodies. In keeping with the theme of the last two conferences, The Australasian Institute of Mining and Metallurgy (AusIMM) has agreed to host the third international mass mining conference, MassMin 2000. The development of MassMin 2000 was motivated through the Julius Kruttschnitt Mineral Research Centre (JKMRC), Brisbane, Australia (in conjunction with Dr Dennis Laubscher of Laubscher and Associates, South Africa and Alan Guest of De Beers, South Africa) which is currently involved in an international study to improve the understanding of block and panel caving methods.

While the main theme of the MassMin 2000 Conference is on large massive orebodies, a section will be included to also discuss general underground methods. This should enable cross-fertilization of ideas between different underground mining methods.

For more information on the conference please contact the MassMin Conference Chairman, Dr Gideon Chitombo. ◆

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## Mintek's Barcza chairs Foresight group\*



Dr Nic Barcza, Mintek's General Manager, Business Development and Technology Commercialization, has been appointed Chairperson of the Mining and Metallurgy Sector Working Group, which is part of the National Research and Technology Foresight Project being conducted by the Department of Arts, Culture, Science and Technology.

The Foresight Project aims to identify technologies and research areas that will support South Africa's social and

economic development over the next 20 years. The project covers 12 sectors which represent major areas of science and technology in South Africa. It involves stakeholders from industry, government, labour, and civil society.

Research and skills development will be based on technologies, identified in the Foresight Programme, that will be able to advance and maintain a commercially viable, sustainable, and environmentally aware mining and metallurgical industry in the future. ♦

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## Mintek researcher shines\*

Patricia Hill of Mintek's Physical Metallurgy Division was awarded the Wirsam Prize for the best student abstract and presentation in the Physical Sciences section at the Electron Microscopy Conference, held from 2-4 December 1998. Patricia's presentation 'An investigation of the Al-Ir-Ru ternary system' was based on her thesis for her MSc degree, which was awarded with distinction at a graduation ceremony of the University of the Witwatersrand in December.

Patricia's investigation is one of a series of studies supported by Mintek to develop a database on phase relationships in the platinum-group metals. Compounds in the Ir-Al-Ru system potentially combine the exceptional corrosion resistance and toughness of the RuAl

intermetallics with the superior high-temperature strength and oxidation resistance of IrAl.

The annual conference, organized under the auspices of the Microscopy Society of Southern Africa (MSSA), was held at the Rand Afrikaans University. The conference marked the start of the run-up to the International Electron Microscopy Conference, which the MSSA has succeeded in inviting to Durban in 2002. ♦

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## Merger creates long-term viable business entity\*

The AECI R&D facilities at Modderfontein become part of the CSIR with effect from 1 February 1999. In terms of the merger agreement, the CSIR will assume ownership of the AECI R&D Department, which is a R60 million turnover operation working in the areas of biotechnology, computational chemistry, chemical process technology, fine chemicals and solid state chemistry. The AECI R&D staff and equipment will largely remain at the Modderfontein premises.

CSIR and AECI both believe that the merging of the R&D facilities into the CSIR will create a long-term viable

business entity. The biotechnology and fine chemicals activities at AECI's R&D facility are the largest of their kind in the Southern Hemisphere. With the international marketing capability of the CSIR the facility has the potential to become a significant global research institute in the above fields. ♦

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