

## Can water governance deepen democracy in South Africa? Towards a new social charter for mining

Anthony Turton, Professor<sup>a,b</sup>

<sup>a</sup>*Centre for Environmental Management, University of Free State*

<sup>b</sup>*Founding Trustee: Water Stewardship Council Trust of Southern Africa*  
E-mail: tony@anthonyturton.com

The transition to democracy in South Africa 18 years ago has changed the governance landscape of the country in a fundamental way. Mining, traditionally the mainstay of the national economy, is clearly in a state of decline, just as water constraints are rising and the pollution of water through acid mine drainage (AMD) is becoming front page news. The recent massacre of protesting miners at Marikana, currently the subject of a judicial board of enquiry, has highlighted the existence of major tensions left unresolved from the democratic transition. The recent downgrade of the South African sovereign risk profile by various international ratings agencies has shown how vulnerable the country is with respect to the raising of capital to fund future job creation initiatives. Actions by aggressive but well-meaning NGO's have further undermined confidence, resulting in the unintended consequence of the potential hostile takeover by foreign interests of mining companies that retain major undeveloped resources on their books, not reflected in the plummeting share prices driven down by persistent contestation. This paper explores these issues by suggesting a framework for empirical investigation, using a recent event as a case study. This suggests that while the mining sector is in deep turmoil, water resource governance has the potential to deepen democracy in South Africa. The emergence of what is being dubbed a New Social Charter for Mining is documented, in which the management of water resources is emerging as a central driver. In conclusion, the framework originally offered as a method of testing the governance processes, is further developed by populating it with empirical evidence gleaned from the case study.

**Keywords:** governance, offset benefits, mine closure.

### 1. Introduction

South Africa has a water-constrained mining-based economy with a dismal history of human rights abuse (Turton et al., 2008). The mining industry, and in particular the gold sector, has played a major role in the South African economy over the last century and a half. In fact, it was the discovery of gold in the Transvaal Republic, one of two sovereign Westphalian states at that time that were controlled by the descendants of early European settlers, that triggered the Second Anglo Boer War between 1899 and 1902, leading to the Union and subsequent Republic of South Africa (Meredith, 2007; Pakenham, 1992). Mining, commenced during times of war, has taken place mostly under non-democratic conditions, becoming a mainstay of the Apartheid regime (Turton,

2009, 2010a). Mining therefore has the potential to resist the democratic process, or to become a vehicle for the inculcation of democratic values, which is termed the deepening of democracy in the context of this paper. The question then arises as to whether water governance in the mining sector is becoming a vehicle for the deepening of democracy in South Africa? Conversely, are powerful mining companies actively undermining democracy by resisting attempts at regulation? The paper is structured in three parts bracketed by an introduction and conclusion. The first part develops a conceptual framework by defining water governance and explaining why mining in water-constrained areas is important. This introduces the notion of a tipping point. The second part is an empirical study of mining in general, and the case of coal mining in Limpopo in particular. The third portion is an assessment of the Limpopo coal mining case against the template generated in the conceptual framework portion.

## 2. Part 1: Conceptual framework – Governance defined

Contemporary literature on water resource management is based on the notion that the world is facing a crisis, and we need to collectively implement integrated water resource management (IWRM) as an appropriate response (WWAP, 2012). A core element of this discourse is that “good governance” is needed, without defining what that might mean (Conca, 2006; Connor et al., 2012; Edwards et al., 2012). The Global Water Partnership defines IWRM as being a process to ensure the coordinated development and management of water, land and related resources by maximizing economic and social welfare without compromising the sustainability of vital environmental ecosystems (Solanes & Gonzales-Villareal, 1999). In this context IWRM is considered to be an integrating process that also involves decision-making about potentially conflicting demands over a given water resource.

Governance is defined by Landell-Mills and Serageldin (1991) as the use of political authority, the exercise of control over society and the management of its resources, for social and economic development. This complements the concept of IWRM defined above by introducing the aspect of political authority as a means to achieve the desired condition of integrating management processes to the benefit of society and the economy. Rogers and Hall (2003) define governance as the range of political, social, economic and administrative systems that are in place to develop and manage water resources, and the delivery of water services at different levels. Hattingh et al. (2007) define governance as a process that supports the legitimacy of government by holding elected officials accountable for the aggregation of interests articulated by special interest groups in society at large. Collectively this led the author and his team to redefine governance as “the process of informed decision-making that enables *trade-offs* between competing users of a given resource so as to *balance protection with beneficial use* in such a way as to *mitigate conflict, enhance equity, ensure sustainability and hold officials accountable*” (Turton et al., 2007: 12). It is this latter definition that will be applied to the case study

in this paper, more specifically where the underlined elements of the definition will be used to determine whether we are seeing the emergence of such a process of governance in the coal mining sector in Limpopo Province.

Unpacking these elements of the chosen definition, we have a conceptual framework of water resource governance as it might apply to the mining sector, which is presented in Table 1.

This raises the question of why mining is relevant in the context of a discussion on water governance? It will be shown in the next section that mining has always been a powerful actor in South Africa, fiercely resisting regulation by an increasingly embattled state. Given the fact that coal mining is now expanding into the Limpopo River basin that is highly water-constrained, conflict over environmental resources has the potential to drive social unrest, which needs to be mitigated if sustained economic development is to be viable. This also raises the issue of a tipping point. For purposes of this paper a tipping point will be loosely defined as a threshold, beyond which the historic manifestation of the way things have been done in the past, can no longer inform the future, by virtue of a fundamental shift in factors such as the regulatory architecture, social responses and market forces applicable to companies listed on international stock exchanges.

### **3. Part 2: Empirical study – Historic evolution of the mining sector in South Africa**

Gold was discovered in 1886 in the Transvaal, a sovereign Boer Republic. This triggered the Second Anglo Boer War as the British asserted their global hegemony by expanding their empire. The evolution of the South African mining sector was thus driven by British aspirations to monopolize the extraction of wealth for repatriation to England, based on the notion that British capital was being used, so Britain should be the (sole) beneficiary (Conan Doyle, 1900; Longford, 1982; Pakenham, 1991). The Boer War saw the first use of concentration camps in which more women and children died than soldiers on the field of battle on both sides, as part of a formal Scorched Earth Policy, designed to bring the Boer commandos, then engaged in a guerrilla war after the capture of Pretoria (the capital city of the Transvaal Republic) under control (Fawcett, 1901; Hobhouse, 1901, 1907; Krebs, 1992; Phillips, 1901; Pretorius, 2001; Raath, 1999; Reitz, 1929; Van Reenen, 2000; Van Rensburg, 1980). Significantly, this aspect of South African history is largely unknown outside of the country, so the shadow that this dark period subsequently cast onto the Apartheid-era remains somewhat unexplored in the literature on governance. The Second Anglo Boer War was thus a resource war with gold as the key driver that resulted in a milieu in which human rights were generally ignored and environmental justice played no role (Evans, 1999). This established the political culture for what later became known as Apartheid.

The significance of the genesis of the gold mining industry in the ashes of the Scorched Earth Policy is that it laid the foundation for a subsequent government, the

Table 1  
Conceptual framework of water resource governance as it might apply to mining.

Element of Governance	Explanation	Empirical Manifestation
Process	This implies the existence of a series of individual actions with a collective outcome being an end result that is generally regarded as being acceptable to the widest range of stakeholders possible.	The existence of a clearly defined set of procedures that culminates in a consensual desired end result.
Informed decision-making	This implies the existence of a series of appropriate data streams and metrics available to all parties, in a format that they understand, and in a time frame that is relevant to any intervention needed.	The existence of a clearly defined process that generates appropriate information understandable to all parties relevant to any management intervention that might be required.
Trade-off's	This implies that costs and benefits are evaluated in a way that enables informed decisions to be taken about what an appropriate balance between resource protection and beneficial use might be.	The existence of the potential to generate viable trade-off's acceptable to the majority of stakeholders in order to achieve a balance between protection and use.
Balance between protection and beneficial use	This implies that the conversion of a natural resource into something of value to society accepts negative impacts, but seeks balance between resource protection and beneficial use.	The existence of the potential for reaching agreement over trade-off's that are acceptable to the majority of stakeholders.
Conflict mitigation	This implies acceptance of the reality that conflicting demands on a given resource, particularly when it is becoming stressed, will result in social conflict that needs to be mitigated as a defined and desirable condition.	The existence of consensus decisions that adequately meet the competing needs of different stakeholders.
Equity enhancement	This implies that resource allocation often takes place under conditions of power asymmetry, so the attainment of a defined end goal of acceptable trade-off's has to be supported through the overall process of decision-making.	The attenuation of conflict potential arising from the realistic probability of reaching agreement about acceptable trade-off's.
Sustainability	This implies that mining, by its very nature, is not sustainable on its own, by virtue of the potential for environmental and social damage. Therefore trade-off's that are acceptable are needed to effectively offset the known potential for damage.	The existence of an uncontested vision about a post-closure future in which the trade-off's that have been agreed to are indeed acceptable and viable.
Accountability of officials	This implies that all parties can be held accountable for their actions, even in the post-closure phase when the mine ceases to exist as an operating entity.	The existence of a process that identifies specific areas, in which accountability needs to be maintained, supported by the capacity to enforce accountability.

minion of Britain, with the sole purpose of facilitating the granting of mining licences and the maximization of profits (Turton et al., 2006). More importantly, there was no legal foundation for human rights, and even less for the protection of the environment, so the architecture of governance that was created by the Act of Union in 1910, had a specific bias to it. A key element of that bias was the blindness of all subsequent governance structures to the impact of mining on human health, the environment and cultural heritage. Emerging as it did, those early governance structures were dominated by the quest to grant mining licences, which constantly trumped any attempts by third parties to regulate the industry by reducing environmental and social impacts. Mining was not possible without water however, so the evolution of major water infrastructure that currently sustains the cities of Johannesburg and Pretoria is closely associated with the needs of the mining sector (Tempelhoff, 2003).

When South Africa became a republic in 1961, it almost immediately became a pariah state, arising from the way the government dealt with the aspirations of the disenfranchised majority (Karis & Carter, 1972; Kasrils, 1993; Mbeki, 1984; Tyler, 1995; Welsh, 2000). This saw the creation of the Armed Struggle to liberate the majority, with Nelson Mandela and others being imprisoned for alleged treason (Mandela, 1994; O'Malley, 2007). Critical to the survival of the increasingly embattled pariah state, was the gold mining industry, then at its peak (Hartnady, 2009), so from 1961 until the transition to democracy in 1994, the mining sector was mostly unregulated and always regarded as a key element of state survival (Turton, 2009). This allowed massive profits to be made, mostly by means of a business model that externalized costs associated with environmental rehabilitation and human health risks (Adler et al., 2007). During this phase of history the gold mining industry engaged in three pivotal actions: firstly, it effectively countered all attempts by the state to regulate it; secondly, it consistently avoided financial liability for human health risks by exploiting the difference between the legal and scientific definition of cause and effect linkages; and finally it created elaborate legal structures in which it could maximize profits by hiding liabilities off the balance sheet (Adler et al., 2006). This indicates that the mining industry is highly adept at evading effective governance when such measures are deemed to be restrictive to its capacity to make profits, raising a question about the role of major corporations in either the deepening, or undermining of democracy (Midlarsky, 1988, 2001; Turton, 2010a).

The dynamics changed when South Africa transitioned to democracy in 1994. The product of complex negotiations in which a new constitution was created (Spitz & Chaskalson, 2000; Turton, 2010b), this democracy was based on a Bill of Rights that had far reaching implications for all. These arise from the new universal right of all citizens to an “environment that is not harmful to their health and wellbeing”, underpinned by the right to have the environment “protected for the benefit of present and future generations” through reasonable legislative and other measures that “prevent pollution and ecological degradation”, “promote conservation” and “secure ecologically sustainable

development" (Chapter 2, Para 24) (Constitution, 1996). Furthermore, government departments are compelled to cooperate in terms of Chapter 3 of the Constitution (1996), which effectively means that the Department of Mineral Resources (DMR) that has been all powerful for a century, is now obliged to consider other factors such as water resource availability, environmental degradation, human health impacts and cultural heritage when granting mining rights. This has set up a new architecture of governance in the water sector that might be applicable to the mining sector by virtue of the unintended consequences of unplanned mine closure in the Witwatersrand goldfields and Mpumalanga coalfields.

#### **4. Is this a tipping point?**

Arising from the fact that the mining legislation prior to 1994 favored the extraction of minerals over all other issues such as human health, environmental degradation and social vulnerability, a series of unintended consequences became evident from 2002 onwards. This started with the decanting of acid mine drainage (AMD) from a point known as 18 Winz Shaft near Krugersdorp in 2002. Decanting refers to the fact that during the life of a mine, water is pumped from the workings to make them safe. Once operations cease, these voids start to flood, causing the water to rise to the surface where it flows over the land into the nearest river. AMD consists of highly acidic water with a pH as low as 3, arising from the oxidization of pyrite-based ore bodies, into which a host of minerals and heavy metals have been dissolved. Given the geology of the Western Witwatersrand Mining Basin, gold is closely associated with uranium, so this decant consists of a sulphate-rich solution in which large quantities of uranium and other toxic heavy metals are dissolved (Hobbs & Cobbing, 2007). Associated with this decant are large spoil piles of residue located across the entire Witwatersrand Goldfield that contain an estimated 430,000 tonnes of Uranium-rich tailings that is highly toxic and mildly radioactive (GDARD, 2011).

During the same period of time a slow onset environmental disaster started to emerge in the coalfields of Mpumalanga arising from inadequate governance of coal production (Hobbs, Oelofse, & Rascher, 2008). Collectively this triggered a plethora of research that started to indicate the sheer scale and complexity of the problem of unplanned mine closure (Coetzee et al., 2002a; Coetzee, Wade, & Winde, 2002b; Coetzee, Venter, & Ntsume, 2005; Coetzee, Winde, & Wade, 2006). The reason that closure had been unplanned is an artefact from the Apartheid-era when state survival was the main focal point of government decision-making, so it simply never occurred to anyone in power that one day mining would end and there might be unintended consequences. The logical conclusion from this work is that a tipping point had been reached in which the environmental and social impacts of mining could no longer be ignored if political stability and investor confidence were to be maintained (Coetzee et al., 2002a; Coetzee, Wade, & Winde, 2002b; Coetzee, Venter, & Ntsume, 2005; Coetzee, Winde, & Wade, 2006;

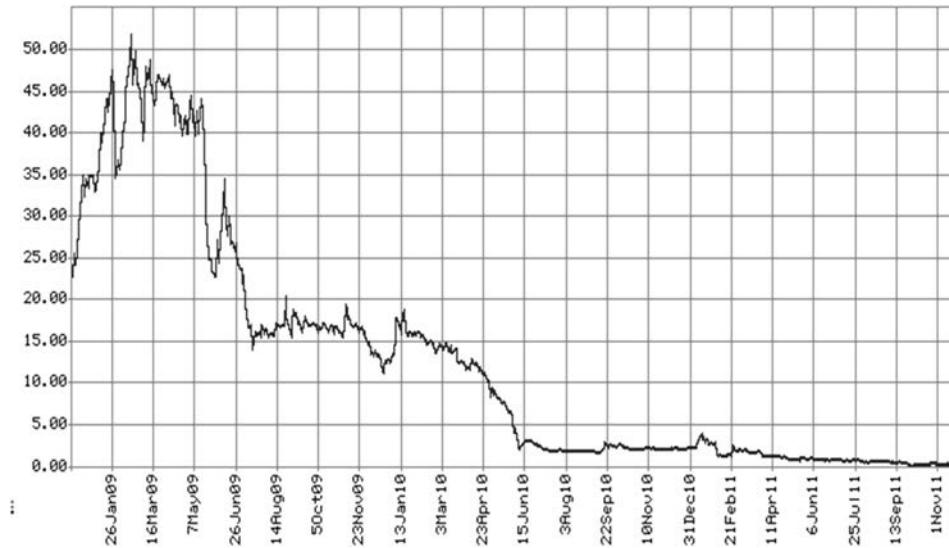


Figure 1. This figure shows the share price for Central Rand Gold, on the AIM board of the London Stock Exchange. This company is one of the central figures in the slow onset disaster of AMD in the South African gold sector.

Van Tonder, 2008; Van Tonder & Coetze, 2008). This resulted in the drive to develop mine closure strategies, but in most cases the mining has either ceased, or is approaching an end, so no adequate financial provision has been made for post-closure rehabilitation while revenues are still flowing. At the time of writing, no closure plans have been implemented, partly because of resistance from the gold mining industry, arising from the fact that this would reduce profits and had not been adequately financed during the life of mine (Strachan et al., 2008; Van Tonder, 2008; Van Tonder & Coetze, 2008).

These can be collectively called legacy issues, arising from the Apartheid-era, over which there seems to be no apparent solution other than to ask the taxpayer to foot the bill. This can be thought of as nationalizing the mining liability, which is being vigorously opposed by the public, agitated into action by a vocal media and fueled by a growing anger at the emergence of allegations of endemic corruption in government (Blaine, 2012; Feinstein, 2007; Moselakgomo, 2011). In this regard three specific issues are relevant. The first is the case of Central Rand Gold, located in the Central Basin and the subject of increased investigation of the link between this company and political leadership (Moselakgomo, 2011). The share price as listed on the AIM Board of the London Stock Exchange collapsed as shown in Figure 1. The second is the case of Aurora, an empowerment company linked to the Zuma family (of which the head is the current President of the country, himself the former subject of corruption allegations) that was given mining rights in the Eastern Basin. This company also collapsed after it became evident that they lacked technical expertise and capital to operate a marginal mine Times (2012).

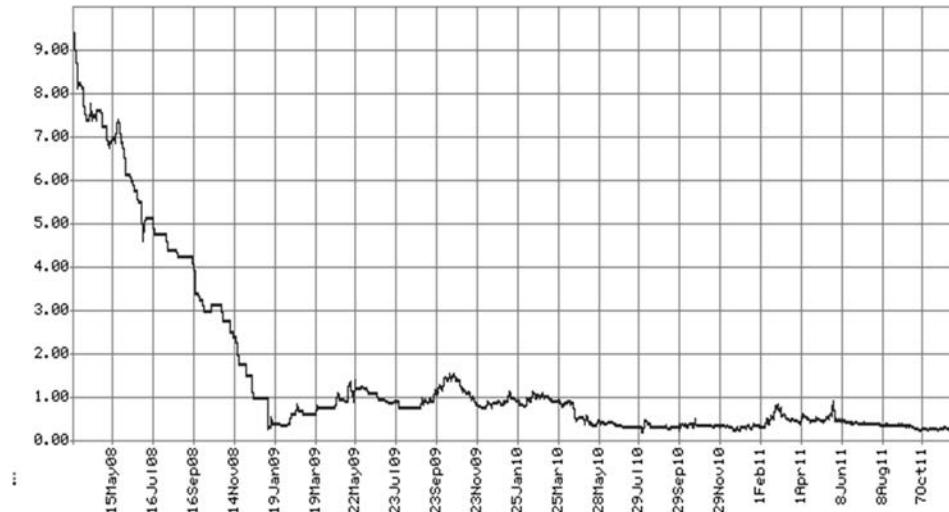


Figure 2. This figure shows the share price for Western Utilities Corporation (Watermark Global PLC) on the AIM board of the London Stock Exchange. This company is one of the central figures in the slow onset disaster of AMD in the South African gold sector.

The third is the case of an entity called Western Utilities Corporation (WUC), also listed on the AIM Board as Watermark Global (PLC). WUC is the creation of a number of mining companies in the Witwatersrand Mining Basin all of which are facing liabilities arising from the raised public awareness of the slow onset disaster driven by AMD and inadequate radioactivity mitigation measures. WUC proposed a plan that would “treat” the AMD using the lowest cost technology for onward sale to 11 million consumers as potable water (Turton, 2010a). As a result of opposition to this plan WUC’s share price has also collapsed as shown in Figure 2 and it has now been de-listed in London with attempts to re-float it in Johannesburg under a new name.

The reason this is a tipping point is because we are now starting to see evidence that legacy issues arising from the unintended consequences of a century of largely self-regulated mining are negatively impacting on Greenfields operations where capital-raising still needs to occur. This is playing itself out in three distinct arenas. The first is the case of African Nickel with mining rights in the Crocodile West (Marico) Water Management Area (a sub-division of the Limpopo River basin). This company met with fierce and unanticipated opposition when it engaged in the mandatory public participation process as part of its mineral exploration rights application, and was later stopped as a direct result of this spontaneous public mobilization. Significantly the opposition to this mining operation was based entirely on legacy issues from the gold mining area<sup>1</sup>. It is not known if African Nickel has merely withdrawn to rethink its future engagement,

<sup>1</sup>See <http://www.grootmarico.com/groot-marico-campaign.php>

or whether it has been defeated, but it is known that the local community was capable of organizing very rapidly using social and other media. They also demonstrated a determination and ferocity in their resistance not seen before. The second is the case of hydraulic fracturing for the exploration of shale gas in the Karoo. While this case is currently ongoing, there has been fierce resistance from the public, again well organized by means of social media<sup>2</sup>. The result has been the successful opposition to the point that it is no longer a certainty that hydraulic fracturing will be conducted until such time as the regulatory framework has been adequately developed. Significantly, a core issue raised by opponents of the process is water contamination, again citing cases from elsewhere, most notably in the mining sector, that can be regarded as legacy issues arising from the Apartheid-era.

The third is a more significant action against coal mining in the South African component of the Limpopo River basin. In this regard there are two sub actions currently under way. The highest profile action has undoubtedly been the extreme hostility triggered by a wide range of entities, to the Vele Colliery located in the vicinity of the Mapungubwe Cultural Landscape World Heritage Site adjacent to the confluence of the Limpopo and Shashe Rivers. It is also central to a Transfrontier National Park that involves South Africa, Zimbabwe and Botswana, linking ultimately to what is known as the Kalahari-Zambezi Transfrontier Conservation Area (KAZA). In addition to this it straddles a transboundary aquifer system shared by South Africa, Botswana and Zimbabwe (Davies et al., 2012), so groundwater management is an emerging component of the larger issue, adding yet another level of complexity. Mapungubwe is a cultural landscape of great spiritual significance to the Vhavenda people, something akin to Ayres Rock in Australia. Mining rights to Vele were developed by an Australian-based company called Coal of Africa (Ltd) (CoAL), jointly listed on the AIM Board of the London Stock Exchange and the Johannesburg Stock Exchange. After sinking a significant sum of capital into this venture, opposition suddenly exploded with such ferocity, driven mostly by the perception that a mining right had been granted without consideration of the cultural heritage aspects of Mapungubwe, that the government was forced to intervene. The NGO coalition that initiated this action was very sophisticated, with international linkages. Consisting of the Centre for Environmental Rights, the Endangered Wildlife Trust, Wildlife and Environment Society of South Africa (WESSA) and the World Wildlife Fund (WWF) as core members, they successfully raised the issue of water licences and cultural sensitivities to the point where the Green Scorpions (a government enforcement agency) "raided" the Vele site in June 2010. This was supported by a media frenzy that generally depicted the company as being a serial offender through the selective presentation of information.

This caused a major loss of investor confidence and the share price, already under pressure from the bad publicity, tumbled to a point where it lost almost half its value

<sup>2</sup>See <http://treasurethekaroo.co.za/>

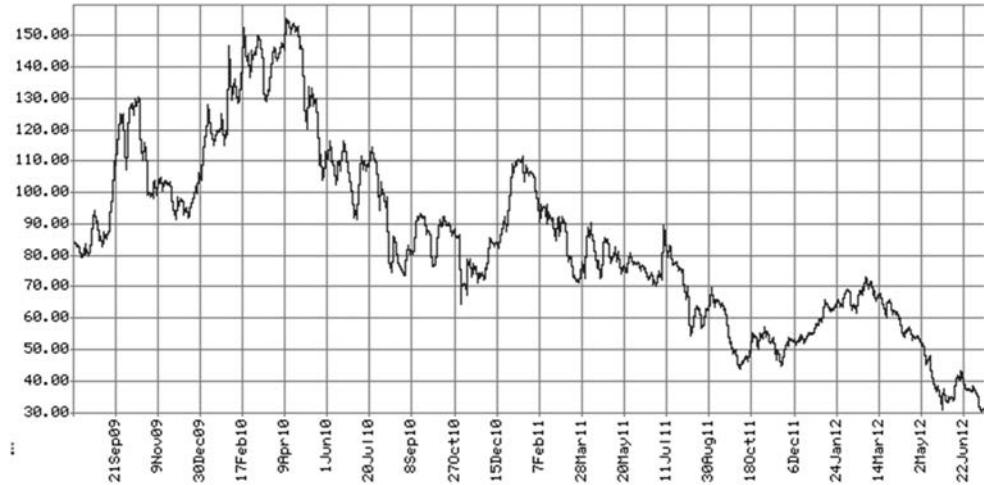


Figure 3. Figure 3 shows the share price of Coal of Africa (Ltd) on the AIM Board of the London Stock Exchange during the period of contestation over water licences for their various operations. The market consistently punished the management response to social challenges, raising the issue of investors as potential players in governance matters.

when compared to three months previously. This raid prompted more media interest and a popular TV environmental program called 50/50 flighted a story about CoAL in October 2010. This shifted the focus to another operation owned by CoAL, known as Mooiplaas Colliery, where mining was also halted. This caused a near vertical drop in share price similar to the trend that occurred during previous spates of bad publicity. A series of messy public relations actions ensued in which the company took various forms of legal action against the media, all of which were won by the company on technical grounds, but which collectively generated a loss of investor confidence. During March 2011 the Integrated Water Use Licence (IWUL) was reinstated at Vele Colliery, but major damage had been done to both the reputation and the cash flow of the mining company. Sensing victory, the NGO coalition again challenged the IWUL and once again it was suspended. This caused new management solutions to be sought so a new senior executive team was brought in as these events were unfolding. This new executive team adopted a different approach and a ground-breaking Memorandum of Agreement (MoA) was negotiated between CoAL, the Department of Environmental Affairs (DEA) and the South African National Parks (SANParks) (MoA, 2011). The share price performance during this period of time of CoAL on the AIM Board of the LSE is shown in Figure 3.

The significance of the MoA is that the issuing of mining licences is the sole prerogative of the DMR, which is an historic artefact from the Apartheid-era, with its origins in the post Anglo-Boer War government purposely structured to facilitate mining above

all other economic activities. It was argued by civil society, now well organized using social and other media, that the awarding of mining rights had to take other factors such as cultural heritage and the availability of environmental resources into consideration. This is why DEA and SANParks are signatories to this specific agreement, effectively staking their rightful claim to future mining right allocations, at least in areas that are water constrained and environmentally sensitive. The outcome of this has been what can best be described as a temporary truce in a bitter war (Blaine, 2012), because hard core conservationists, many of whom have dedicated their entire lives to the creation of the Transfrontier National Park, remain opposed to Vele Colliery (Schultz, 2012), even though it is now fully legally compliant as the most regulated mine in the country.

CoAL is busy rolling out a number of new order mining rights applications in what is known as the Greater Soutpansberg region. These are clustered on the future collieries of Makhado, Chapudi and Mopani, each impacting a number of farms that are currently operating as tourism destinations. As a result of the reputational damage sustained over the Vele debacle, a range of activists, mostly from the nature conservation and farming communities, but supported by a select group of journalists, are now opposing every legal step in the belief that their opposition can sustain the loss of investor confidence, and thus terminate all prospecting in the Limpopo Coalfields, which contain massive quantities of unmined minerals (Schultz, 2012).

Hoveling in the wings are two sovereign funds – India and China – each representing a coal-hungry economy and wanting to do a deal with the South African government with whom they have good relations (De Lange, 2012; Groenewald, 2012a,b). South Africa recently joined the BRICS (Brazil, Russia, India, China and South Africa) grouping of emerging economies. Significantly these sovereign funds are not sourced from open markets so they are insensitive to market forces, or governance oversight, associated with financial reporting systems functioning at major stock exchanges. They are also interested in bypassing normal interaction with what is legally defined as Interested and Affected Parties (I&AP's) by virtue of their preference to deal with a state-owned mining entity rather than a privately owned company. These sovereign funds have capital but no mining rights (De Lange, 2012; Groenewald, 2012a,b), so they are eager to purchase rights that might become available if the current owners are no longer capable of raising capital to develop the mine, because of the challenge by the well-meaning opponents of mining. This would result in the emergence of a state-owned mining company with the Government of India, China and South Africa as partners, but not being responsive to governance oversight from international stock exchanges. An unintended consequence of sustained opposition might thus be a worse situation than that which is currently being contested.

Has this MoA laid the foundation for a new architecture of water governance in the mining sector? Can this contribute to the deepening of democracy in a country where a democratic culture is largely absent? Or will the mining companies merely resist at-

tempts to regulate them as they have done in the past, thereby undermining the fledgling democracy?

### **5. New architecture of water governance in the mining sector**

The MoA signed by CoAL, the DEA and SANParks is precedent-setting by virtue of the fact that it now formalizes a process that is embedded in the new democratic constitution (MoA, 2011). More specifically it brings the DEA and SANParks into the decision-making process for future mining rights allocations in areas that are environmentally sensitive, thereby breaking the traditional monopoly enjoyed by DMR as an artefact of the Apartheid-era. It also mandates the creation of offset trading to balance protection against beneficial use, while opening up a debate around how this would best be negotiated and enforced. It is therefore the potential foundation for future water governance in the mining sector country-wide, even if the Department of Water Affairs (DWA) – also traditionally bypassed by DMR when mining rights are issued – is not a signatory.

The reader needs to understand that when South Africa transitioned to a democracy in 1994, all legislation from the past was abandoned, because it was deemed to be contaminated by Apartheid and thus inconsistent with the requirements of a modern constitutional democracy. As each law was repealed, the institutional memory embedded in the massive body of jurisprudence was lost, with nothing to replace it. The unintended consequence of this was reinforced by the constitutional imperative of cooperative governance as enshrined in Chapter 3 (Co-operative Government), which is interpreted by most government functionaries as meaning that one government department will not challenge another (i.e. cooperation implies non-confrontation). This means that when a powerful entity like DMR issues mining rights, these are not publically challenged by less powerful departments like DEA and the DWA, even when it is abundantly clear that the mining right will have major impacts on other cultural, environmental and water rights. This leaves only civil society to act, which again creates the unintended consequence of eroding investor confidence in general, while exacerbating tensions between society and government (Blaine, 2012).

The signing of the MoA happened in a milieu in which mining remains a sector that is perceived by the public to be privileged above all others, the democratic constitution notwithstanding. In effect the DMR is a super-department, an historic artefact of the Second Anglo Boer War and subsequent Apartheid-era (Turton, 2009, 2010a), with *de facto* power greater than the DEA and the DWA. Furthermore, according to Mbeki (2009, 2010, 2011), this hegemony is reinforced by the fact that the mining industry has created the concept of Black Economic Empowerment (BEE) as a strategy for survival during the transition to democracy, and this is now being used to benefit a select group of people with political connections to the ruling African National Congress (ANC) party (Feinstein, 2007).

The first implication of the MoA (2011) is that the DEA has asserted its right to be part of the regulatory environment, noting that it is the line department with sole competence in issues pertaining to environmental impacts associated with mining. This is significant from a water governance perspective because Adler et al. (2007) note that mine water management is currently handled through four primary and several secondary pieces of legislation, implemented by three different government departments; and mine waste is addressed through two primary and eleven secondary pieces of legislation, implemented by three primary and six secondary government departments. So while it is unlikely that this MoA (2011) will solve all of these legacy issues, it does at least assert the right of the DEA and SANParks to be regarded as equal in status to DMR consistent with the national Constitution (1996).

The second implication of the MoA (2011) is that it mandates the acceptance by CoAL of the International Council on Mining and Minerals (ICMM) and World Heritage Committee's Sustainable Development Framework. This is very significant because in effect it means that the company has now agreed to adhere to international best practices, but more importantly, to apply its mind to the transformation of what has been traditionally a dirty industry with a significant pollution impact, to what could become a cleaner process with a smaller environmental footprint.

The third implication of the MoA (2011) is that it mandates the optimization of benefits for local communities and the recognition of Transfrontier National Parks as a core concept. This is highly significant because it provides core elements of future governance structures that deal with both water and off-mine livelihood creation. It also effectively promotes the notion of a biosphere with core, buffer and peripheral areas, without mentioning this concept by name.

The fourth implication of the MoA (2011) is that it recognizes the concept of offset development in order to sustain off-mine livelihoods. This is dealt with specifically in Article II of the MoA, but given further structure in Article III that focuses on cultural heritage and water resource management.

The implication for CoAL is that the MoA places the company on a new trajectory, capable of dealing with the fallout from the Vele debacle, transforming into something that might potentially become the blueprint for coal mining in water constrained areas that are both culturally and ecologically sensitive. This has triggered, within the executive level of the company, a desire to rethink the fundamental model underpinning mining, which is being referred to as a New Social Charter for Mining.

## **6. Is this a new social charter for mining?**

The fundamental business model underpinning the whole mining sector in South Africa from the 19th to the early 21st Century, has been one that seeks to maximize profits by externalizing liabilities (Adler et al., 2006, 2007). This was possible while three necessary conditions were in place:

- The environment needed to have the capacity to absorb the pollution load to which it was subjected. In other words, the environment was used as a sink for waste material produced by mining, and that worked for over a century, but this is no longer viable by virtue of the fact that the unintended consequences of mining are now patently manifest, consistent with the notion of a tipping point (Coetzee et al., 2002a; Coetzee, Wade, & Winde, 2002b; Coetzee, Venter, & Ntsumo, 2005; Coetzee, Winde, & Wade, 2006; Van Tonder, 2008; Van Tonder & Coetzee, 2008).
- The government needed to have the willingness and capacity to protect the mining sector against the protestations of the citizens directly affected by the externalization of costs model that underpinned the process. This was possible during the Apartheid years when the pariah state needed the revenues from mining to sustain it against a concerted attack, both internally from armed insurrection, and externally from economic sanctions (Turton, 2007; Turton, Patrick, & Rascher, 2008). This is no longer necessary, or indeed possible, under a democratically elected government that is accountable to the citizens (CSIR, 2008).
- Society needed to be complacent enough not to challenge mining companies, or the government, over the direct personal implications of an externalization of costs model. The rising social anger towards both government and the mining sector, makes it patently obvious that social complacency can no longer be taken for granted (Blaine, 2012; Johnston & Bernstein, 2007; Turton, Patrick, & Rascher, 2008). The plummeting share prices of the companies listed above show that they are not immune from fallout.

This means that if mining is to remain viable in South Africa under prevailing social, political and environmental conditions, when capital is to be sourced from public stock exchanges, then the fundamental business model underpinning the mining sector will have to be transformed. As a direct result of the opposition to CoAL noted above, consistent with the MoA (2011), a different business model is emerging with a new architecture of governance that has water as a key component. This new model seeks to transform the company from being a stand-alone extractive business to becoming a partner for regional development instead (CoAL, 2012a,b,c). Partnership is consistent with the mandatory requirements of the MoA (2011) and it seeks to do the following:

- Benefits are to be broadened beyond the traditional scope, to embrace the creation of off-mine livelihoods, most probably in the tourism and agricultural sectors. This is being done by means of a formal policy called the CoAL LEGACY Program (CoAL, 2012a). This creates a broader range of benefits to be distributed across a wider range of beneficiaries. More importantly it acknowledges that mining is a transient occupier of the landscape that is inhabited by people with deep cultural and economic linkages, so it recognizes the need for being a partner with entities

that will remain after mining has ceased. A critical element of this is governance that will be accomplished by means of structures not yet in mainstream use in the mining sector, and thus still in need of creation and refinement.

- Dis-benefits in the form of ecological impacts, most notably to water resources, are to be limited using modern science, engineering and technology. Given that a major fear by the impacted communities is water quality degradation, particular attention is being given to governance of water. This is dealt with by means of a formal policy called Closure with PRIDE (CoAL, 2012b). This has emerged from the formal closure strategy in the Definitive Feasibility Study for Makhado Colliery (CoAL, 2011), so it is an evolutionary process. Significantly, this means that the Makhado Colliery will be the first new coal mine in South Africa that has been designed, financed and managed from cradle to grave with closure in mind. This makes CoAL a potential trend-setter in the governance of water in the mining sector, a fact that is reinforced in the CoAL RESPECT for Water Policy that deals specifically with the management and governance of water resources in the context of a plus-sum paradigm (CoAL, 2012c).

This is being called a New Social Charter for Mining within the executive levels of CoAL (CoAL, 2012a), designed to achieve the following strategic objectives:

- Gain legitimacy for mining through a reduction in the contestation of mining rights applications and routine regulatory compliance measures.
- Creation of a robust spatial development framework that clearly identifies different land uses, areas of endemic biodiversity, areas of cultural sensitivity, core and buffer zones.
- Mainstream technology to the benefit of all.
- Enhance governance and oversight *via* appropriate key performance indicators (KPI's) at all line functional levels of operation that feed into a coherent Sustainability Reporting System accessible to all stakeholders in a format that they understand and can use.
- Maximize benefit-sharing by increasing the range of potential benefits and the span of potential beneficiaries.
- Minimize the known disbenefits through engineering and process design underpinned by effective rehabilitation and concurrent backfill where appropriate.
- Transform the zero-sum dynamics of endemic water scarcity to plus-sum dynamics by creating “new water” through technology supported by governance structures.

Planning underway will see the creation of a Closure Visioning Group called for in the Mine Closure Strategy of the Definitive Feasibility Study of Makhado Colliery (CoAL, 2011) (see Figure 4). From a governance perspective, the creation of a Closure Visioning Group is triggered by the need for the company to engage formally with stakeholders over statutory processes underpinning the Integrated Water Use Licence Application (IWULA), the Environmental Impact Assessment (EIA) and the Social and

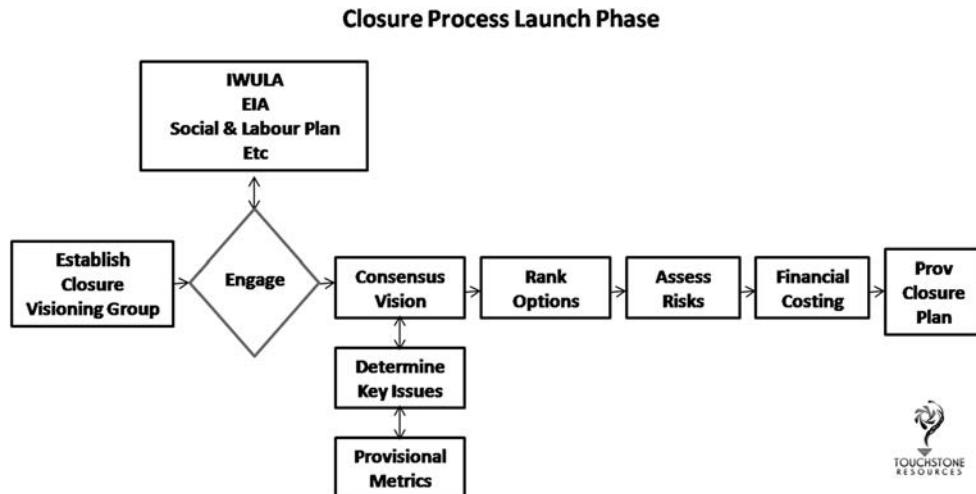


Figure 4. Figure 4. The governance process that underpins the mine closure strategy at Makhado Colliery (CoAL, 2011) and now embedded in the Closure with PRIDE Policy (CoAL, 2012b).

Labour Plan. The Visioning Group is a formally structured body that brings together legitimate representative of I&AP's, as well as representatives from government and the company. Their task is to create a vision for the future that effectively deals with all of their combined concerns over issues such as water resource degradation, the creation of off-mine livelihoods and other offsets. This group will determine the key issues that need to be dealt with to the satisfaction of all parties, as well as the metrics needed to monitor progress over the life of mine. Those metrics will eventually be translated into KPI's used to manage the process over the life of mine, as well as to report to shareholders and regulators as appropriate. Emerging from this Consensus Vision is a set of options that are assessed in terms of risk and costing. This results in a Provisional Closure Plan that is merged with the Mining Plan to become the Integrated Mining and Closure Plan. The latter then becomes the formal business model to be adopted throughout the life of the mine, fully resourced from revenues generated over that entire period, and thus capable of achieving closure without the unintended consequences that are manifesting elsewhere in South Africa where no formal closure plans were adopted. This will institutionalize the contestation and thus reduce risk as perceived by investors active on the various stock exchanges in which the company is listed (London, Johannesburg and Perth). Significantly, it will also create sufficient financial provision for post-closure rehabilitation, which is currently lacking in South Africa as a result of legacy issues noted elsewhere.

## **7. Part 3: An assessment of the conceptual framework for water governance**

As noted in Part 1, governance has been defined by the author and his team (Turton et al., 2007: 12) to include specific elements as indicated in Table 1. It therefore remains to be seen how these elements (shown in the left hand column of Table 2) are being implemented in the case study under review (center column of Table 2). The right hand column indicates how this is consistent with the MoA (2011) that triggered this reform process.

From this conceptual framework it is evident that the CoAL LEGACY Program (CoAL, 2012a), Closure with PRIDE (CoAL, 2012b) and the CoAL RESPECT for Water Policy (CoAL, 2012c) collectively comply with all of the essential elements of governance embraced by the chosen definition (Table 1). It can be concluded that what started out as a catastrophic set of circumstances for CoAL, the regulatory authorities and I&AP's, has given rise to a new architecture of governance that could conceivably become the blueprint for mining in areas that are culturally and environmentally sensitive such as that occurring in the Limpopo Province of South Africa. As this is a work in progress, on-going evaluation is invited by scholars with an interest in experimentation with governance process and structure. At the time of writing however, this conceptual framework is being used in the negotiation of a series of agreements with parties currently contesting the IWULA at Makhado Colliery, and it is believed that the prognosis for a successful outcome is good. This is the first time that these new ideas are actually being tested on the ground, among parties with a deeply entrenched history of hostility to mining in general, and to CoAL in particular, so the outcome is not 100% predictable. It is anticipated that this will reflect as a stabilization of the share price and a gradual reversal of the past trend as investor confidence is restored, but only time will tell if this optimism is warranted.

## **8. Conclusion**

In the introduction two questions were posed. Is governance in the mining sector becoming a vehicle for the deepening of democracy in South Africa? Conversely, are powerful mining companies actively undermining democracy by resisting attempts at regulation? From the case study presented it seems evident that governance, most notably over environmental resources including water, is starting to manifest as a potential deepening of democracy in South Africa. While the final outcome is not yet known, indications are that the MoA between CoAL, DEA and SANParks is a tipping point, in that the hegemony of the DMR has been challenged by another government department, and the overall thrust of the emerging agreement has been the creation of a governance framework that has the potential to mitigate conflict by bringing hostile parties together in the negotiation of acceptable trade-off's. Certainly in this specific case, the mining company concerned is not avoiding any attempt to regulate it. On the contrary, the new

Table 2

Evaluation of the Coal of Africa (Ltd) approach in terms of the proposed conceptual framework of water resource governance.

Element of governance	Implementation	MoA (2011) compliance
Process	The Closure Strategy involves a series of iterative engagements that clearly constitute a logical process capable of self-adjusting and thus adaptive. This is formalized in the Closure with PRIDE Policy (CoAL, 2012b) and institutionally housed in the Closure Visioning Group.	Yes, the spirit is about engagement so it is process-related, further supported by formal company policy and the creation of a viable institutional structure.
Informed decision-making	The process underpinning the Consensus Vision implies that all parties will become informed of the issues and thus capable of decision-making over time. This implies informed consent, which is further enhanced by the existence of an Integrated Reporting System yielding appropriate information, available to all, on areas defined by the I&AP's through the Closure Visioning Group process.	Yes, the essence of the agreement is that complex decisions need to be made by multiple parties in order to balance competing interests.
Trade-off's	The essence of negotiation that underpins the Consensus Vision means that trade-off's will be made in a rational and informed manner. This is formalized in the CoAL LEGACY Program (CoAL, 2012a) designed to manage offset's beyond the life of mine.	Yes, trade-offs are inherent to the creation of offsets specifically mandated, further supported by formal company policy.
Balance between protection and beneficial use	The process of reaching consensus between all parties means that balance will be an emergent property of the process. This is formalized in the CoAL RESPECT for Water Policy (CoAL, 2012c), but is also present in Closure with PRIDE (CoAL, 2012b) and the LEGACY Program (CoAL, 2012a).	Yes, the essence of the agreement is about striking a balance between competing interests, further supported by formal company policy.
Conflict mitigation	The formal structure of the Closure Visioning Group, and the creation of agreed metrics reported in an open and transparent manner over the life of mine, means that conflict is institutionalized and thus mitigated by procedure. The development of agreed offset benefits mitigates conflict by balancing different needs.	Yes, the essence of the agreement is about conflict mitigation arising from seemingly incompatible interests.

Table 2  
(Continued.)

Element of governance	Implementation	MoA (2011) compliance
Equity enhancement	The Closure Visioning Group allows the power asymmetry typically present between mining companies and I&AP's to be balanced. Equity is thus an emergent property of the process, further entrenched in the form of the CoAL LEGACY Program (CoAL, 2012a) and the CoAL RESPECT for Water Policy (CoAL, 2012c).	Yes, the agreement is about equity between all stakeholders, including government departments. This is further enhanced by the enforcement of formal company policy.
Sustainability	The very notion of a vision of a post-mining situation, and the acceptance of the concept of off-mine livelihood creation throughout the life of mine, implies that sustainability is an emergent property of the process. This is further entrenched in the CoAL LEGACY Program (CoAL, 2012a).	Yes, the agreement is based on the desire to create a sustainable balance between competing users of natural resources over time.
Accountability of officials	The creation of a formal structure, populated by I&AP's over the life of mine, underpinned by an agreed set of metrics reported to shareholders and regulators, means that accountability is an emergent property of the process. Accountability implies stewardship that is entrenched in the CoAL RESPECT for Water Policy (CoAL, 2012c).	Yes, the agreement mandates the creation of a process that evolves over time in which CoAL will be held accountable for its stewardship role.

executive management brought in to develop a turnaround strategy arising from the Vele debacle, has developed a corporate culture that is open and inclusive, engaging with I&AP's in excess of what the actual legal requirement is.

Water governance in the mining sector is centered on balancing the historic business case for mining, with externalized costs as a key element, against an increasingly militant local population, demanding that the various rights enshrined in the 1996 Constitution be met. This suggests that we are seeing an embryonic form of a New South African Mining Charter emerge, potentially capable of being applied to the rest of the mining sector over time. More significantly, the governance structures emerging from this process are such that they have the potential to deepen democracy, by institutionalizing engagement and balancing out the power asymmetries typical of the historic trend. This has major implications for the South African economy as a whole, most notably the ability to create sustainable jobs by attracting foreign direct investment, so the issue is of national strategic importance. Smart mining executives are starting to understand these drivers and are repositioning their companies in this changing regulatory landscape.

NGO's play an important role in creating an unfavorable investor climate to leverage their power asymmetry, but this needs to be done responsibly, because it is much harder to restore confidence once undermined. Shareholders also play a role in governance as they are sensitive to perceptions of risk arising from contestation by I&AP's. The desired outcome is a new water governance structure in which mines are allowed to get on with their business, but as partners in rural development with new forms of oversight under the banner of planned mine closure and offset benefit-sharing, rather than mere transient occupiers of a given landscape.

## References

- Adler, R., Funke, N., Findlater, K. & Turton, A. R. (2006). *The Changing Relationship between the Government and the Mining Industry in South Africa: A Critical Assessment of the Far West Rand Dolomitic Water Association and the State Coordinating Technical Committee*. Pretoria: Council for Scientific and Industrial Research (CSIR).
- Adler, R., Claassen, M., Godfrey, L. & Turton, A. R. (2007). Water, mining and waste: A historical and economic perspective on conflict management in South Africa. In *The Economics of Peace and Security Journal*, 2(2), 32–41.
- Blaine, S. (2012). Water lawsuit is 'War against the state'. In *Business Day*. Accessed online at <http://www.businessday.co.za/articles/Content.aspx?id=176001>.
- CoAL (2011). Mine closure. In *Definitive Feasibility Study of the Makhado Project*. Johannesburg: Coal of Africa (Ltd).
- CoAL (2012a). *CoAL LEGACY Program*. Policy document. Johannesburg: Coal of Africa (Ltd).
- CoAL (2012b). *Closure with PRIDE*. Policy document. Johannesburg: Coal of Africa (Ltd).
- CoAL (2012c). *The CoAL RESPECT for Water Policy*. Policy document. Johannesburg: Coal of Africa (Ltd).
- Coetze, H., Venter, J. & Ntsume, G. (2005). *Contamination of Wetlands by Witwatersrand Gold Mines – Processes and the Economic Potential of Gold in Wetlands*. Council for Geosciences (Report No. 2005-0106). Pretoria: Council for Geosciences.
- Coetze, H., Wade, P., Ntsume, G. & Jordaan, W. (2002a). *Radioactivity Study on Sediments in a Dam in the Wonderfonteinspruit Catchment*. DWAF Report. Pretoria: Department of Water Affairs and Forestry.
- Coetze, H., Wade, P. & Winde, F. (2002b). Reliance on existing wetlands for pollution control around the Witwatersrand gold/uranium mines in South Africa – Are they sufficient? In B. J. Merkel, B. Planer-Friederich, & C. Wolkersdorfer (Eds.), *Uranium in the Aquatic Environment* (pp. 59–65). Berlin: Springer. doi: 10.1007/978-3-642-55668-5\_6.
- Coetze, H., Winde, F. & Wade, P. W. (2006). *An Assessment of Sources, Pathways, Mechanisms and Risks of Current and Potential Future Pollution of Water and Sediments in Gold-Mining Areas of the Wonderfonteinspruit Catchment* (WRC Report No. 1214/1/06). Pretoria: Water Research Commission.
- Conan Doyle, A. (1900). *The Great Boer War*. London: Smith Elder & Co.
- Conca, K. (2006). *Governing Water: Contentious Transnational Politics and Global Institution Building*. Cambridge, MA: MIT Press.
- Connor, R., Klintenberg, P., Turton, A. R. & Winpenny, J. (2012). Water management, institutions and capacity development, in *WWAP* (World Water Assessment Programme). *The United Nations World Water Development Report 4: Managing Water under Uncertainty and Risk*. Paris, UNESCO.
- Constitution (1996). *The Constitution of the Republic of South Africa*. Act 108 of 1996. Pretoria: Government Printer.
- CSIR (2008). *High Confidence Study of Children Potentially Affected by Radionuclide and Heavy Metal Contamination Arising from the Legacy of Mine Water Management Practices on the Far West Rand*

- of South Africa. Project Concept Note, dated 26/2/2008. Pretoria: Council for Scientific and Industrial Research (CSIR).
- Davies, J., Robins, N. S., Farr, J., Sorenson, J., Beetlestone, P. & Cobbing, J. E. (2012). Identifying trans-boundary aquifers suitable for international resource management in the SADC region of Southern Africa., in *Journal of Hydrogeology*.
- De Lange, J. (2012). Indian Coal Giant in Limpopo Rights Talks. In MiningMX. Accessed online at <http://www.miningmx.com/news/energy/Indian-coal-giant-to-buys-Limpopo-rights.htm>.
- Edwards, H., Loucks, D. P., Turton, A. R. & Winpenny, J. (2012). Transforming water management institutions to deal with change. In WWAP (World Water Assessment Programme). *The United Nations World Water Development Report 4: Managing Water under Uncertainty and Risk*. Paris, UNESCO.
- Evans, M. M. (1999). *The Boer War: South Africa 1899–1902*. Osprey Military. Mechanicsburg: Stackpole Books.
- Fawcett, M. H. (1901). *The Concentration Camps in South Africa*. London: Westminster Gazette.
- Feinstein, A. (2007). *After the Party: A Personal and Political Journey inside the ANC*. Johannesburg: Jonathan Ball.
- GDARD (2011). *Feasibility Study on Reclamation of Mine Residue Areas for Development Purposes: Phase II Strategy and Implementation Plan* (Report No. 788/06/02/2011 (Final)). Umvoto Africa in association with TouchStone resources.
- Groenewald, Y. (2012a). Limpopo goes it alone on nationalization. In *City Press*. Accessed online at <http://m.news24.com/citypress/Business/News/Limpopo-goes-it-alone-on-nationalisation-20120114>.
- Groenewald, Y. (2012b). India, Limpopo coal deal under scrutiny. In *City Press*. Accessed online at <http://www.citypress.co.za/Business/News/India-Limpopo-coal-deal-under-scrutiny-20120128>.
- Hartnady, C. J. H. (2009). South Africa's gold production and reserves. In *South African Journal of Science*, 105, 328–329.
- Hattingh, J., Maree, G. A., Ashton, P. J., Leaner, J., Rascher, J. & Turton, A. R. (2007). Introduction to ecosystem governance: Focussing on Africa. *Water Policy* 2(9), 5–10.
- Hobbs, P. J. & Cobbing, J. E. (2007). *A Hydrogeological Assessment of Acid Mine Drainage Impacts in the West Rand Basin, Gauteng Province* (Rep. No. CSIR/NRE/WR/ER/2007/0097/C. CSIR/THRIP). Pretoria: Republic of South Africa.
- Hobbs, P., Oelofse, S. H. H. & Rascher, J. (2008). Management of environmental impacts from coal mining in the upper olifants river catchment as a function of age and scale. In M. J. Patrick, J. Rascher, & A. R. Turton (Eds.), Reflections on water in South Africa, Special Edition of *International Journal of Water Resource Development*. 24(3), 417–432.
- Hobhouse, E. (1901). *Report of a visit to the camps of women and children in the Cape and Orange River Colonies*. London: Friars Printing Association Ltd.
- Hobhouse, E. (1907). *The Brunt of War and Where it Fell*. Portrayer Publishers: London.
- Johnston, S. & Bernstein, A. (2007). *Voices of Anger: Protest and Conflict in Two Municipalities*. Report to the conflict and governance facility (CAGE). Johannesburg: The Centre for Development and Enterprise.
- T. Karis, & G. M. Carter (Eds.) (1972). *From Protest to Challenge: A Documentary History of African Politics in South Africa 1882–1964*. Stanford: Hoover Institution Press.
- Kasrils, R. (1993). *Armed and Dangerous: My Undercover Struggle against Apartheid*. Oxford: Heinmann Educational Publications.
- Krebs, P. M. (1992). "The Last of the gentleman's wars": Women in the Boer War concentration camp controversy, *History Workshop Journal* (33), 38–56.
- Landell-Mills, P. & Serageldin, I. (1991). Governance and the external factor. In *Proceedings of the World Bank Conference on Development Economics*. Washington, DC: World Bank.
- Longford, E. (1982). *Jamieson's Raid: The Prelude to the Boer War*. London: Weidenfeld & Nicholson.
- Mandela, N. R. (1994). *The Long Walk to Freedom: The Autobiography of Nelson Mandela*. London: Little, Brown & Co.
- Mbeki, G. (1984). *South Africa: The Peasants' Revolt*. London: IDAF.

- Mbeki, M. (2009). *Advocates for Change: How to Overcome Africa's Challenges*. Johannesburg: Pan MacMillan.
- Mbeki, M. (2010). Wealth creation: Only a matter of time before the hand grenade explodes. Business day. Available online at <http://www.businessday.co.za/articles/Content.aspx?id=133902>.
- Mbeki, M. (2011). *Architects of Poverty: Why African Capitalism Needs Changing*. Johannesburg: Picador.
- Meredith, M. (2007). *Diamonds, Gold and War: The Making of South Africa*. Johannesburg: Jonathan Ball.
- Midlarsky, M. I. (1988). Rulers and the ruled: Patterned inequality and the onset of mass political violence. *American Political Science Review*, 82(2), 491–509.
- Midlarsky, M. I. (2001). Democracy and the environment. In P. F. Diehl, & N. P. Gleditsch (Eds.), *Environmental Conflict*. Boulder, CO: Westview Press.
- Moselakgomo, A. (2011). Minister Shuts down Kunene's Gold Mine. In *Sowetanlive*, 27 September, 2011. Accessed online at <http://www.sowetanlive.co.za/news/2011/09/27/minister-shuts-down-kunene-s-gold-mine>.
- MoA (2011). Memorandum of agreement between the department of environmental affairs, coal of Africa (Ltd) and South African national parks, to ensure the integrity of the Mapungubwe World heritage site.
- O'Malley, P. (2007). *Shades of Difference: Mac Maharaj and the Struggle for South Africa*. London: Penguin Books.
- Pakenham, T. (1991). *The Scramble for Africa*. Johannesburg: Jonathan Ball.
- Pakenham, T. (1992). *The Boer War*. Harper Perennial: London.
- Phillips, L. M. (1901). *With Rimington in the Boer War*. London: Edward Arnold.
- Pretorius, F. (2001). *Scorched Earth*. Cape Town: Human & Rousseau.
- Raath, A. W. G. (1999). *The British Concentration Camps of the Anglo Boer War 1899–1902: Reports on the Camps*. Bloemfontein: The War Museum.
- Reitz, D. (1929). *Commando: A Boer Journal of the Boer War*. London: Faber & Faber.
- Rogers, P. & Hall, A.W. (2003). *Effective Water Governance*. TEC Background Papers No. 7. Stockholm: Global Water Partnership.
- Schultz, W. (2012). Coal of Africa's mining plans north of the Soutpansberg, *Soutpansberg Life*, 1(1).
- Solanes, E. & Gonzales-Villareal, F. (1999). *The Dublin Principles for Water as Reflected in a Comparative Assessment of Institutional and Legal Arrangements for Integrated Water Resources Management*. Stockholm: Global Water Partnership.
- Spitz, R. & Chaskalson, M. (2000). *The Politics of Transition: A Hidden History of South Africa's Negotiated Settlement*. Johannesburg: Witwatersrand University Press.
- Strachan, L. K. C., Ndengu, S. N., Mafanya, T., Coetzee, H., Wade, P. W., Msezane, N., Kwata, M. & Mengistu, H. (2008). *Regional Gold Mining Closure Strategy for the Central Rand Goldfield* (Report No. 2008-0174). Council for Geosciences. Pretoria: Department of Mineral Resources.
- Tempelhoff, J. W. N. (2003). *The Substance of Ubiquity: Rand Water 1903–2003*. Vanderbijlpark: Kleio Publishers.
- Times (2012). Aurora's Zuma Must be Held to Account for Mine Debacle. Times Live, 13 January 2012. Accessed online at <http://www.timeslive.co.za/opinion/editorials/2012/01/13/aurora-s-zuma-must-be-held-to-account-for-mine-debacle>
- Turton, A. R. (2007). The hydropolitics of cooperation: South Africa during the Cold War. In V. E. Grover (Ed.), *Water: A Source of Conflict or Cooperation?* (pp. 125–143). Enfield, NH: Science Publishers.
- Turton, A. R. (2008). *Three Strategic Water Quality Challenges that Decision-Makers Need to Know About and How the CSIR Should Respond* (CSIR Report No. CSIR/NRE/WR/EXP/2008/0160/A). Keynote address, A Clean South Africa, presented at the CSIR Conference "Science real and relevant", 18 November 2008. Pretoria: Council for scientific and industrial research (CSIR).
- Turton, A. R. (2009). South African water and mining policy: A study of strategies for transition management. In D. Huitema, & S. Meijerink, (Eds.), *Water Policy Entrepreneurs: A Research Companion to Water Transitions around the Globe* (pp. 195–214). The Netherlands: Edgar Elgar.

- Turton, A. R. (2010a). The politics of water and mining in South Africa. In K. Wegerich, & J. Warner, (Eds.), *The Politics of Water: A Survey* (pp. 142–160). London: Routledge.
- Turton, A. R. (2010b). *Shaking Hands with Billy: The Private Memoirs of Anthony Richard Turton*. Durban: Just Done Publications.
- Turton, A. R., Schultz, C., Buckle, H., Kgomongoe, M., Malungani, T. & Drackner, M. (2006). Gold, scorched earth and water: The hydropolitics of Johannesburg. *Water Resources Development*, 22(2), 313–335. doi: 10.1080/07900620600649827.
- Turton, A. R., Hattingh, J., Claassen, M., Roux, D. J. & Ashton, P. J. (2007). Towards a model for ecosystem governance: An integrated water resource management example. In A. R. Turton, H. J. Hattingh, G. Maree, D. J. Roux, M. Claassen, & W. F. Strydom (Eds.), *Governance as a Trialogue: Government – Society – Science in Transition* (pp. 1–28). Berlin: Springer Verlag. doi: 10.1007/978-3-540-46266-8\_1.
- Turton, A. R., Patrick, M. J. & Rascher, J. (2008). Setting the scene: Hydropolitics and the development of the South African economy. In M. J. Patrick, J. Rascher, & A. R. Turton (Eds.), *Reflections on Water in South Africa*, Special Edition of *International Journal of Water Resource Development* 24(3), 319–323.
- Tyler, H. (1995). *Life in the Time of Sharpeville – and Wayward Seeds of the New South Africa*. Cape Town: Kwela Books.
- Van Reenen, R. (2000). *Emily Hobhouse: Boer War Letters*. Cape Town: Human & Rousseau.
- Van Rensburg, T. (1980). *Camp Diary of Henrietta E.C. Armstrong: Experiences of a Boer Nurse in the Irene Concentration Camp 6 April – 11 October 1901*. Pretoria: Human Sciences Research Council (HSRC).
- Van Tonder, D. (2008). *Regional Mine Closure Strategy for the Far West Rand Goldfield* (Report No. 2008-0248). Council for Geosciences, Pretoria: Department of Minerals and Energy.
- Van Tonder, D. & Coetzee, H. (2008). *Regional Mine Closure Strategy for the West Rand Goldfield* (Report No. 2008-0175). Council for Geosciences, Pretoria: Department of Minerals and Energy.
- Welsh, F. (2000). *A History of South Africa*. London: Harper Collins Publishers.
- WWAP (World Water Assessment Programme) (2012). *The United Nations World Water Development Report 4: Managing Water under Uncertainty and Risk*. Paris, UNESCO.