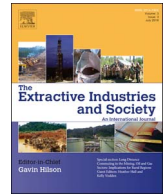


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Original article

Power and Accumulation Coal Mining, Water and Regulatory Failure

Kally Forrest^{a,*}, Lesego Loate^b^a *Society Work & Development Institute – University of the Witwatersrand, 1 Jan Smuts Ave Braamfontein, Johannesburg, 2000, South Africa*^b *School of Geography, Archaeology and Environmental Studies – University of the Witwatersrand, 1 Jan Smuts Ave Braamfontein, Johannesburg, 2000 South Africa*

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ABSTRACT

Coal mining companies in South Africa have evaded transformative water licencing laws. This article examines how and why South Africa's coal mining water regulatory systems have failed. In light of BEE (Black Economic Empowerment) policies it scrutinises contradictory state imperatives of black class formation versus the protection of water resources in a water scarce country. A case study of the maize farming area of Delmas in Mpumalanga province found that all coal mines transgress water laws through formal and 'grey zone' systems which legalise the illegal. This has consequences for water quality, agriculture and food security. This is compounded by the state's weak enforcement in which the department responsible for issuing licences dominates a crumbling cooperative governance regime. Farmers resist mining but their rights are trumped by the elevation of mining over the environment. The article contributes to international commentary on coal mining's impacts and regulation by demonstrating the importance of analysing underlying socio/political issues which engender environmental destruction. Unless this context is unpicked it will not be possible to understand why harmful environmental practices persist, or to advocate for change and make interventions to prevent the destruction of natural resources.

1. Introduction

In South Africa many failed regulatory systems exist which have implications for deepening democracy. Mining is an important industry where regulatory accountability has miscarried. This article seeks to understand how and why actors in coal mining have evaded transformative laws with reference to water management and the issuing of water licences by the state.

In the literature internationally the environmental impacts of carbon intensive energy and coal mining has been a focus. This has included examination of surface and groundwater pollution, acid mine drainage, surface water scarcity, aquifer destruction, and environmental degradation in places such as the USA, China, India, Indonesia and Australia (Straskaba, 1983; Olem, 1983; Peng, 2011; Mishra and Das, 2017; Merriam et al., 2013; Pimentel et al., 1982; Hota and Behera, 2015; Pimentel et al., 1982; Fatah, 2008; Scott et al., 2012; Colaguirri and Morrice, 2015; Mishra and Mishra, 2017).

Some studies highlight the economic impacts of coal related water pollution on the environment and agriculture and its socio-economic externalities. Others examine regulatory tensions around the water-energy-food nexus that drive competing water demands in the USA and China. They also examine the impact of competing interests and legislative frameworks on water regulation, challenges of cooperative

governance in federalist mining and water laws, post-mining rehabilitation and its impacts on water, the shifting importance of water due to mine pollution, and the implications for the water-energy-food nexus in economic development (Israel, 1981; Rapp, 2011; Sangi, 2010; Casey and Mitchell, 2013; Tan et al., 2015).

Related literature on environmental justice with a mining focus examines the way politics intersects with economics in countries like Brazil, Chile, and Peru in relation to natural resources, resulting in the marginalisation of poor and indigenous communities. It assesses how economic liberalisation and booms in mining have affected water availability and rights of the rural poor, the extension of extractivism into water resources, poor regulation of mining's effects on water, conflicts between mining and other economic sectors over water resources, and the way foreign mining capital's investment in water-stressed areas foments conflict. (Dupuits and Garcia, 2016; Delmote, 2016; Rodriguez-Labajos and Martinez-Alier, 2015; Bebbington and Williams, 2008). Yet other investigations approach environmental impacts and regulation of coal mining from the perspective of low-carbon energy transitions geared to avert ecological crises (Wishart, 2012; Roger et al., 2008).

Examinations of coal mining and water regulatory failure in Africa are almost non-existent. Much South African research highlights coal mining's environmental damage and deals with the socio-economic

* Corresponding author.

E-mail addresses: info@swop.org.za (K. Forrest), 1476811@students.wits.ac.za (L. Loate).

impacts on health, human settlements, land degradation, agricultural land loss and water pollution (Hallowes and Munnik, 2016; Centre for Environmental Rights, 2016; Groenewald, 2012; McCarthy and Pretorius, 2009). This article references literature on environmental regulatory failure in South Africa (Hallowes and Munnik, 2016; Centre for Environmental Rights, 2016; McCarthy and Pretorius, 2009) but concentrates on the neglected area of coal mining water regulatory failure and the dangers this holds for the commercial agricultural sector and food security. It complements South American writing on mining water regulatory failure although such literature does not analyse the relationship between political economies and mining's broken regulations.

In South Africa coal has been entrenched in the political economy through the Minerals Energy Complex which has driven industrialization. It includes a network of relationships between the private sector in fields such as mining, manufacturing, finance and state owned enterprises (SOEs). (Baker et al., 2015, 8). Under apartheid the MEC was owned and managed by white mining corporates with strong ties to Western markets. Corporates depended on cheap, low-skilled black labour which manifested in high levels of black poverty and racially based inequality which continues today. (Altieri et al., 2015; Eberhard, 2011; Baker et al., 2015; Burton and Winkler, 2014; Creamer Media Coal Report, 2015). The MEC has been historically dominated by a small number of white owned major mining companies and currently five produce 85% of the country's coal (Burton and Winkler, 2014, 2). White mining corporates have also more recently become global players on international markets.

Coal is strategic to South Africa's economy in the export trade as well as for domestic energy feedstock. Development in the Global South has increased coal demand from which South Africa has benefited (Creamer Media Coal Report, 2015). Coal is the largest mining revenue generator, contributing 1% to GDP, employing 90 000 people, paying R19 billion in wages in 2014 and is a vital source of foreign exchange¹ (PriceWaterhouseCoopers, 2016; Baker et al., 2015). The state's energy utility, Eskom is responsible for 90% of electricity generation and buys 53% of coal for its 13 power stations (Altieri et al., 2015). Water regulation thus sits at the centre of important economic and policy issues.

The state has restructured ownership in the industry historically dominated by white corporates to make space for black junior miners. This it does through transformative laws, as well as through Eskom providing black companies with coal supply contracts (CSAs) which now account for 30% of its supply although it still depends on a few large mainly white corporations (Eberhard, 2011).

This article examines how and why South Africa's coal mining water regulatory systems have failed. In the light of BEE (Black Economic Empowerment) policies it also examines whether a dual water regulatory system operates favouring junior black companies over coal majors. Does the first tier operate at a visible level with formal standards of reporting and accountability, while a second tier functions in a 'grey zone'² of formal and informal practices? The article scrutinises the contradictory state imperatives of black class formation versus the protection of water resources in a water scarce country.

In addition it examines, through a case study in Delmas in Mpumalanga Province, if a bias exists in the way laws have been framed and applied by the state. Does mining trump other water interests and what are the implications for water supply and food security? And further is this peculiar to the Delmas area in South Africa and also to the international experience of coal mining?

The Case Study was chief in informing our findings. However a triangulation of methods was used which included interviewing

stakeholders and accessing commentary and policy documents.

2. Black miners emerge, white majors thrive

The coal industry is dominated by large corporations – Exxaro, Glencore Xstrata, Anglo American, South 32 and Sasol Mining³ which hold a monopoly on the profitable export market (Eberhard, 2011). However as Mitchell from The Chamber of Mines (CoM) comments, 'It's no longer six companies running the country, now it's 75. There's a move away from monopolies and it's a broader ownership base.'⁴

The passing of the MPRDA (Mineral Petroleum Resources Development Act) aimed to weaken corporates' and their hoarding of rights to facilitate the entry of BEE entrepreneurs. The MPRDA articulated with the Broad Based Black Economic Empowerment Act expressed through the Mining Charter. Under the Charter corporations must guarantee 26% black ownership. Also from 1996 the ANC government reduced capital and exchange controls allowing corporates to unbundle domestically and move listings abroad. This often involved selling assets to the aspirant black bourgeoisie (Ashman and Fine, 2015).

Black entrepreneurs entered the industry in various ways as the sector developed. The immediate post-1994 period was associated with political patronage as relations of mutual benefit developed between white corporates and the ANC political establishment. White companies approached politically connected BEE partners to favourably position them with the ANC government to ensure access to contracts and mining rights where delays were common (Cargill, 2010, p 88). Thus the black elite's entry into mining was mediated by white corporations. At times BEE companies became wholly owned black enterprises with some like Exxaro, Shanduka and African Rainbow Minerals becoming significant players. However some BEE activity was naked rent seeking involving little productive investment. By the 2000s in some cases 'legal' corrupt activity had slid into political cronyism defined by Transparency International as 'the manipulation of policies, institutions, and rules of procedure in the allocation of resources and financing by decision-makers who abuse their position to sustain power, status and wealth' (Transparency International, 2009, p14).

It was in this context that the DMR, tasked with distributing mining licenses, was drawn into promoting influential ANC networks whose business interests were conjoined with BEE as a tool of wealth redistribution. Licences were allocated liberally but selectively to powerful black actors. The DMR as broker acted on a political mandate in the guise of an economic one allocating licences to politically connected black business who donated to the ANC. This was not unlawful but indicated that the DMR was overreaching its mandate. Companies wishing to object to individuals getting special treatment held back for fear of DMR officials denying access to resources (Cargill, 2010, pp 98–99).

The next generation of black junior miners struggled to enter the industry. Juniors in coal are small/medium registered operations generally involving opencast activity, with about 200 employees in one or two mines and an annual turnover of about R30 million, and total assets of between 18–100 million (Mitchell and Granville, 2002; Mitchell and Sakoane, 2002). They may be foreign owned; BEE companies attached to corporates to fulfil 26% black ownership; independent black companies; or black companies contracting to larger mines. BEE companies have seen the most growth and are the focus in this article.

Obtaining mining licences involves costly studies. The lack of loan finance is an obstacle for junior black miners who are perceived as risky by the investment community (Mitchell and Granville, 2002). Ayanda

¹ <http://chamberofmines.org.za/sa-mining/coal> accessed 19 February 2016

² The grey zone is 'a murky area where normative boundaries dissolve, where state actors and political elites promote or actively tolerate and/or participate in damage making.' Auyero, 2007. *Routine politics and violence in Argentina* Cambridge University Press. New York, p32

³ Anglo recently sold its Eskom mines to Seriti Resources Holdings which could become a large player

⁴ Interview Grant Mitchell Chamber of Mines Emerging Miners with K. Forrest 7.7.2016

Bam, CEO of Kuyasa junior, complained of government's lack of support and obstructive state bureaucracy forcing juniors into corruption,

If you can't get a water licence, this could delay you for years... So why should R10 000 [bribe] be an obstacle... The policies are good. It's the implementation and the institutions. ... The work done by the political and executive arm gets confused with this... Political influence is standard. You must move in the right circles.⁵

Another junior CEO, Wonderboy Manzini from Masemanzi Mining told of the grey areas he traversed to enter coal mining,

You must find an individual in the DMR... offer money ...pop up money all the way... because mining rights can take two years... although it's better now. You rely on that individual to know what to expect. Big companies have done this before so they know... Some mine without water licences. Some get a mining permit and then mine and get a water licence later. Some officials say you can mine, some say you can't.⁶

It is 'grey zone' activities like these that prompt bigger mines to assert,

Smaller mines have less will, less money, less integrity, and are less environmentally conscious. Junior miners get in and get out and make money as fast as possible. Water Affairs does not police junior mines properly – they are not fined... Junior mines if there is too much rain can't control it – don't manage levels, can't pump out, don't separate clean and dirty water and it spills into dams, rivers and wetlands.⁷ (Anglo American Coal, Ritva Muhlbauer)

We interrogated such perceptions concerning compliance with water regulations in our study.

3. Delmas coal case study

3.1. Selection of Delmas

Coal mining, historically centred on the Highveld Central Basin of the Mpumalanga Province, is home to most of South Africa's electricity generation (Creamer Media Coal Report, 2015). This study however examines the newer Delmas coalfields also in Mpumalanga. Until 12 years ago two mines operated but as the Central Basin reserves depleted, 17 greenfields have emerged.

Delmas lies at the headwaters of the Olifants River catchment and tributaries rising in its surrounds flow into the Bronkhorstspruit, Loskop and other dams which merge into the Olifants, and ultimately into the Limpopo and the Mozambique river system. Thus water flowing out of Delmas has large footprints.

Delmas is a fertile agricultural area described as 'the maize basket of Johannesburg'.⁸ Farmers contend that government favours mining over agriculture particularly as the DMR has granted mining and prospecting authorisations on all except two farms in the area (Fig. 1).

Delmas is dolomitic terrain which includes the large Botleng Dolomitic Aquifer. It has a higher than average rainfall of 600–850 mm per annum and contributes to drier areas of the downstream Olifants River.⁹ In the rainy season the Aquifer recharges springs, wells, wetlands and boreholes (Nealer et al., 2011).

Agriculture consumes most water although dry (rainfed) farming is common. The municipality's drinking water is provided by Gauteng's Rand Water and from two large municipal boreholes. Farmers buy

bottled drinking water while small rivers are a water source for informal communities and cattle. Delmas boasts many wetlands and pans that filter out pollutants with cleansed streams joining rivers downstream. Wetlands detain some water allowing for the replenishing of ground water and boreholes. However Delmas' Victor Khanye Municipality (VKM) does not keep a required register of wetlands so mining's impact is not monitored.¹⁰

All these water resources are vulnerable to coal mining so the research adopted an area-wide perspective rather studying a singular mine supporting the contention that, '... mining applications, must take the regional context into account, and the effect that the rate of exploitation of the resource may have on the long term sustainability of an area' (Centre for Sustainability in Mining and Industry, 2010).

3.2. Case study

Most mines are opencast except for Delmas Coal. Ownership included foreign and local, black and white, juniors and majors. In all cases black ownership was present ranging from 26% to majority holding. It was difficult to access information from companies. Admittance to mine property to compare water licences with actual conditions was impossible and gatekeeping routine. Corporate transparency was fragile or non-existent. Thus observations were limited to external impacts, interviews and commentary.

Officially mines were Water Use Licence (WUL) compliant although this had not always been the case. Exxaro's Leeuwpan began in 2006 and obtained an IWUL (Integrated Water Use Licence) including for its extension in 2011. Brakfontein received a WUL in 2014 but before this had been mining without. Keaton's Vanggatfontein applied in 2008, began mining in 2009, and only received an IWUL in 2015 (Keaton Energy, 2015, pp 10 & 38). Kangala, issued with a six year IWUL in 2016, had mined without a licence for three years prior to this, while the licence gives the impression of a greenfield so that the DWS (Department of Water & Sanitation) did not have to acknowledge the lengthy transgression.¹¹ Delmas Coal took ownership in 2002, applied for a water licence in 2010, and received it in 2015, arguing it was compliant as former laws did not require a WUL. All mines had disregarded DWS delays and operated illegally.

Long delays in obtaining WULs had financial consequences and juniors risked collapse. Said Bam, 'There is huge frustration ... If an official demands a bribe, you won't say as it will create a bad relationship with that official and they will come and find fault on your mine every day so this goes unreported. There is corruption at high and low levels of government. We also corrupt officials as business people. It happens both ways.'¹²

The acquisition of a WUL thus entailed official and unofficial measures. However it was one matter to obtain a WUL and another to comply with it.

3.2.1. Coal major Exxaro: wetland mining

Exxaro emerged from a black empowerment deal involving Kumba Resources and Eyesizwe Coal. It began extracting at Leeuwpan 9 kilometres from Delmas in 2006. Leeuwpan produces for export and domestic markets and supplies Eskom's Majuba power station (Exxaro Resources, 2015).

In 2011 the mine dug a trench around the Weltevreden wetland six kilometres from its Leeuwpan operations. This was to prevent rain water from entering the wetland in preparation for mining. To dewater the wetland it required a WUL from the DWA (Department of Water Affairs – now DWS) to 'impede the flow of water' from a water course as well as permission to extract inside the pan (s21c National Water Act

⁵ Interview Ayanda Bam, Kuyasa Mining with K. Forrest 5.7.2016

⁶ Interview Wonderboy Manzini, Masemanzi Mining with K. Forrest & L. Loate 11.8.2016

⁷ Interview Ritva Muhlbauer, Manager Water & Coal Anglo American with K. Forrest 20.5.2016

⁸ Interview Victor Khanye officials with K. Forrest & L. Loate 14.7.2016

⁹ Interview Chief Fire Officer Victor Khanye Municipality with K Forrest 20.7.2016

¹⁰ Interview municipal officials

¹¹ Interview Keaton Environmental Manager, Karen Chetty with L. Loate 5.8.2016

¹² Interview Bam

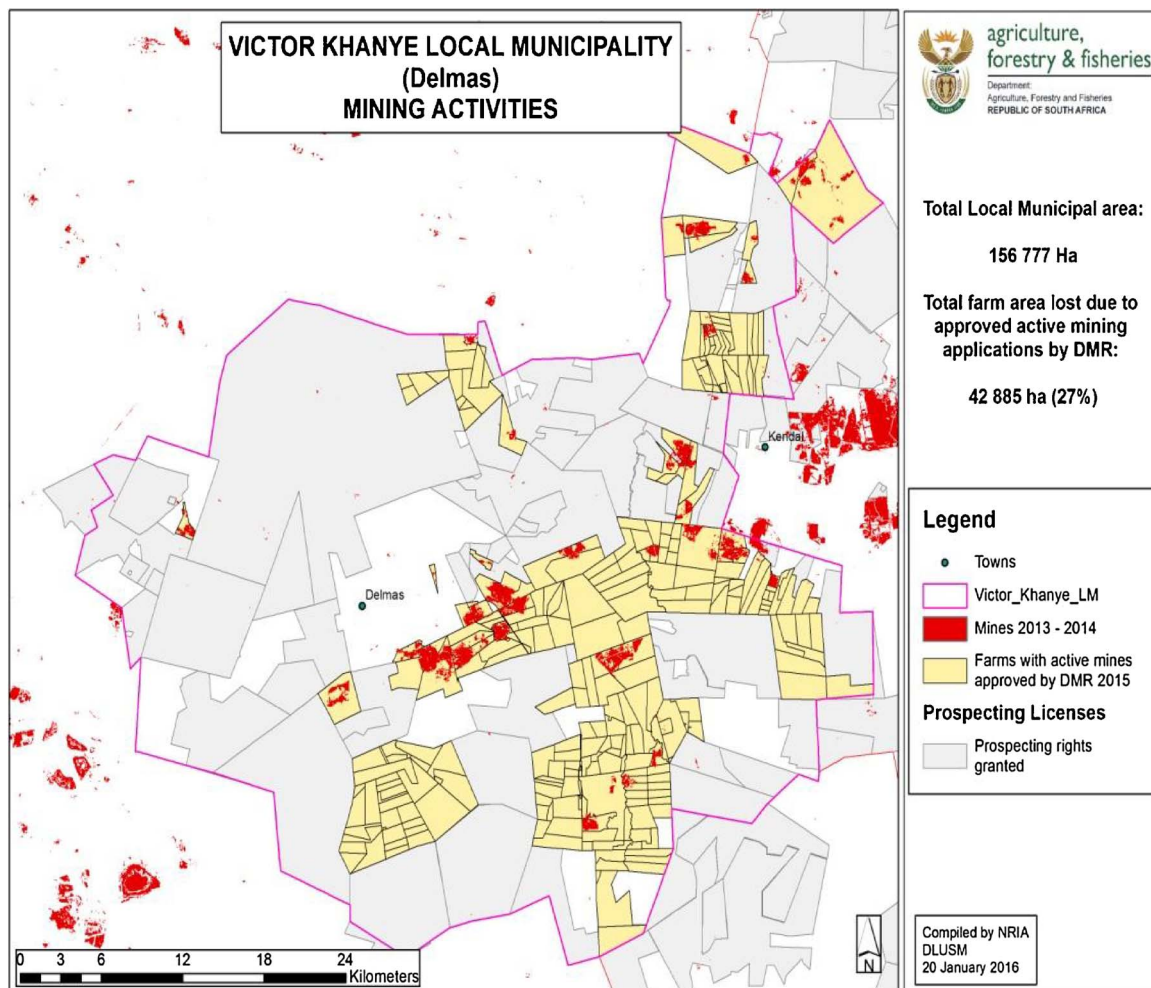


Fig. 1. Victor Khanye Local Municipality (Delmas) Mining Activities.

(NWA) 1998).

Farmers relied on the wetland for irrigation and for watering cattle. It also supplied the Bronkhorstspuit River flowing from the pan. Farmers objected on the grounds that Leeuwan had no WUL and regulations state that no mining activity may occur within 500 metres of a wetland (s21(c) and 21(i) NWA 1998). Confronted by mine indifference, farmers complained to the DWA which issued a directive to stop mining in June 2012 with which Leeuwan complied.¹³ Subsequently the mine claimed it had a WUL and that, 'Leeuwan complies with mining, water use and environmental legislation.'¹⁴

A battle ensued to access Leeuwan's WUL which neither the company nor the DWA would provide.¹⁵ A PAIA (Promotion of Access to Information Act) application forced Exxaro to produce the licence which revealed that the mine only had rights at the Leeuwan wetland. The company meanwhile released a statement confusing the two wetlands. Licences require precise coordinates which it transpired 'were somewhere out in the Atlantic Ocean' (Fig. 2).¹⁶

In September Exxaro recommenced mining. The DWA was alerted whilst Exxaro appealed to the Water Tribunal which the Minister soon after disbanded. Thereafter the company successfully litigated on the

basis that the disbandment of the Tribunal left it without a legal channel of appeal.¹⁷ The DWA appealed, but later withdrew and mining continues until today. The only difference is that Leeuwan now has a licence to mine Weltevreden despite the DWA's directive to cease mining remaining in force.

Weltevreden was not an isolated Exxaro transgression. A Middelburg (in Mpumalanga) farmer protested that Exxaro had bored holes in his wetland leaving a dry cavity forcing his cattle and labourers to walk long distances to another pan (Die Beeld, 2010). In 2012 the DWA charged the Glisa Exxaro mine for water transgressions including mining through the Grootpan wetland and changing the course and dumping waste into a river after the DWA had issued a pre-directive (Die Beeld, 2012).

A wetland cannot be rehabilitated after extraction.¹⁸ Exxaro, a coal major, ignored the spirit of the law and broke the law with impunity. This is concerning given that over half South Africa's wetlands have been destroyed.¹⁹

3.2.2. Junior miners: water transgressions

The Exxaro example challenges the supposition that majors are

¹³ Directive in terms of Section 53 (1) of the NWA No 36 of 1998, for engaging in unlawful mining activity in a watercourse on portion 7 of Weltevreden 227 Ir: Exxaro Leeuwan Coal

¹⁴ <http://oxpeckers.org/2013/12/ways-to-kill-a-wetland/> accessed 7/6/2016

¹⁵ 'Response to Exxaro's response to the PAIA application submitted on October 30, 2012'

¹⁶ Interview Frans Fuls with K. Forrest 26.5.2016

¹⁷ <http://oxpeckers.org/2013/12/ways-to-kill-a-wetland/>

¹⁸ Interviews T McCarthy with K Forrest 1.6.2016; interview Delmas Farmers A,B,C,D & E: with K Forrest & L Loate 12.07.2016; Victor Khanye Municipality officials with K Forrest & L Loate 15.07.2016; Department of Agriculture: Scientific Manager Natural Resources, Inventories and Assessments, Hein Lindeman with K Forrest 29.9.2016

¹⁹ <https://africageographic.com/blog/5-things-you-should-know-about-south-africas-wetlands/> accessed 5/5/2017

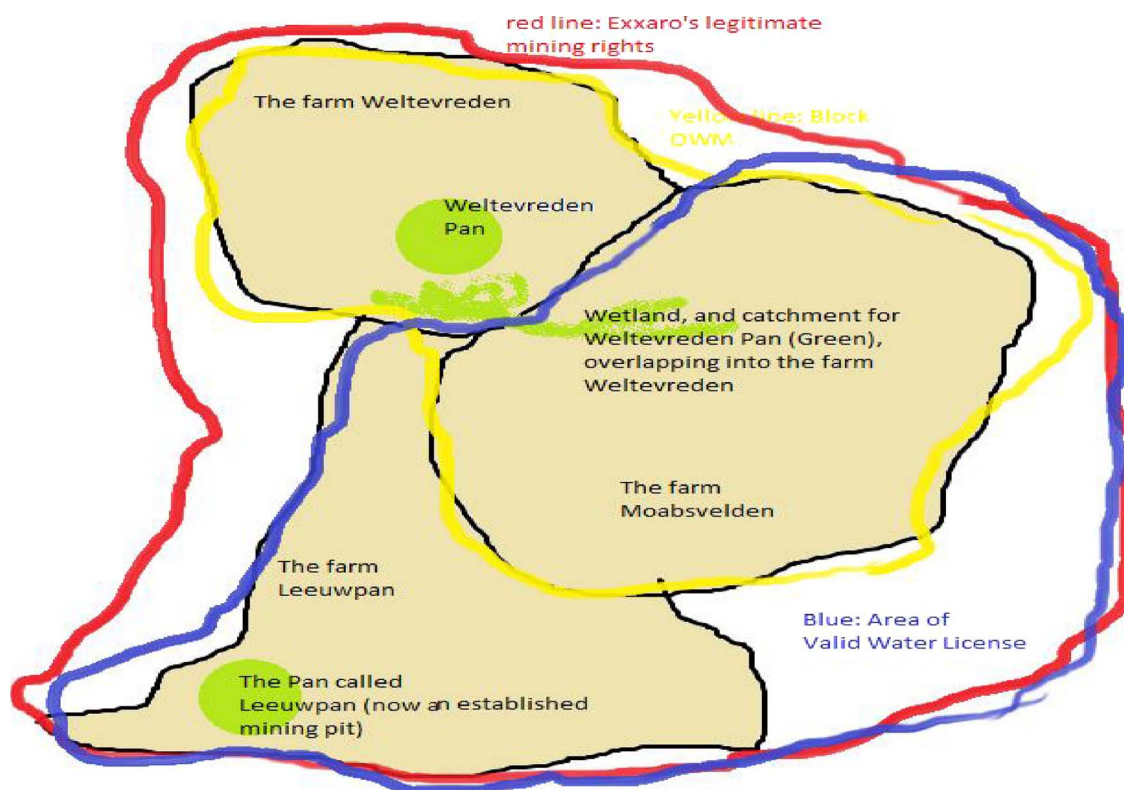


Fig. 2. Exxaro failed to differentiate between Leeuwpan and Weltevreden wetlands and to differentiate between a mining and water licence.

more regulatory compliant than junior miners. But how were Delmas' juniors behaving?

Kuyasa acquired Delmas Coal (DC) in an empowerment deal in 2002 from Ingwe Coal, a BHP Billiton subsidiary. It supplies Eskom and is viewed by CoM as a junior success.²⁰

Below DC lies the Wilge River which snakes through Delmas farms and onto agricultural areas downstream. However it is dammed by a bridge built 15 years ago by a previous miner to create a reservoir of water. Companies contracted to the mine pump out water for mining operations. This is unlawful under the NWA and is contrary to its WUL which states, 'Structures must be designed in a way to prevent the damming of stream/river water' (Republic of South Africa, 2016). The mine is responsible for activities discharged by its contractors. Meanwhile across the bridge the Wilge in winter had become a trickle. Downstream, Brakfontein was discharging contaminated water into the same river.

A farmer on the Meitjiesgoedkuil farm lives on the doorstep of DC. Coal dust blows across his maize fields from five large dumps which has devastating impact on his crop. A wedge of black soil bears sickly plants and with each rainfall the dust seeps deeper into the ground water. He commented, 'Over the last ten years it has got worse as they mine more intensively...'²¹

A kilometre away on the edge of his field lies the Haweklip railway siding where mines such as Keaton dump coal into containers. Up to 100 trucks queue and create clouds of dust as coal slides into containers. Again the dust leaches into the soil destroying two kilometres of land. The farmer has unsuccessfully complained to the mine and is currently involved in litigation.²²

Vanggatfontein is owned by Johannesburg Stock Exchange (JSE) listed Keaton Energy. Its sales stood at R865.7 million in 2015 with 17 years mine life remaining. Eskom pressured it to mine without a licence

to secure its coal supply but later pressed it to be compliant. When it mined without a licence it did not meter monitor its water use or account to the DWS for consumption. Since it acquired an IWUL it has received two DWS invoices but is disputing the amounts (Keaton Energy, 2015, pp 13 & 28).

Keaton holds quarterly meetings with affected parties. Farmers learnt through this forum that it had no rehabilitation plan pointing to deficiencies in the licensing process which requires one.²³ Observers believe the relationship between the mine and DWS officials is too cosy and that officials are poorly trained and do not know what to look for.²⁴

Kangala mine started in 2013 with an eight-year Eskom CSA. It cleared record earnings in 2015 before tax of R138 million (Universal Coal, 2015, p4).

Regulations require that groundwater quantity is monitored from mine boreholes on a monthly basis and its quality on a quarterly basis (Republic of South Africa, 2016, p4). The farmer on the adjacent Middelbult farm complained to the DWS about fracturing and contamination of the aquifer chamber under his farm which supplies his borehole, due to Kangala's blasting. DWS officials visited but could not test the borehole water because they lacked the necessary equipment. A mine official later tested it pronouncing it potable but the farmer commented, 'When I asked him to drink it he refused.'²⁵ Coal dust also clogs his borehole pump leading to its breakdown despite it having operated since the 1960s without prior contamination.²⁶

The farmer asserts that Kangala is authorized to channel specified amounts of dirty water from stockpiles but the DWS fails to monitor this as biannual audits require, 'I have only seen them once and that was when I laid a complaint'²⁷ DWS' audits do not include affected fenceline

²⁰ Interview Mitchell & Bam

²¹ Interview Farmer F with K. Forrest 13.7.2016

²² Ibid

²³ Interview Farmers A & B with K. Forrest & L. Loate 20.7.2016

²⁴ Telephone interview former Keaton Energy Environmental Consultant, Piet Smit, with L. Loate 26.07.2016; joint interview Delmas farmers

²⁵ Interview Farmer G with L. Loate 28.07.2016

²⁶ Ibid

²⁷ Ibid

farmers and he feels powerless when facing off the mine and state. Commented a farmer citing a former Keaton consultant, ‘The DMR comes and we must supply inspectors with cookies and they sign off reports.’²⁸

The Tegeta Brakfontein mine began in 2006 as a subsidiary of the Indian Gupta family’s Oakbay Investments Group (Kasl, 2013, p1). It has a 10 year Eskom contract to supply Majuba and also supplies the domestic market (Comrie, 2016; Competition Tribunal, 2016, p2).

The mine, according to its licence, should have ten groundwater monitoring boreholes but it does not specify the mechanisms such as water meters or flow and water level analysis (Republic of South Africa, 2016, p14). A fenceline farmer contends, ‘There is no proof that they have boreholes on that mine. Instead they come to monitor groundwater quality from the boreholes of neighbouring farms which means if they are contaminated it cannot be proven that their mine is the source.’²⁹

When Tegeta bought the mine it continued to use an unlined Pollution Control Dam (PCD) not compliant with DWS specifications so waste water leached into the ground. A former Brakfontein engineer commented, ‘...building or changing infrastructure while a mine is operating is very difficult and expensive because it can affect production.’³⁰ Brakfontein thus mined in defiance of regulations and contaminated water spilled onto the neighbouring farm. The mine now has three PCDs as well as sumps to ensure water from stockpiles does not mix with clean water.³¹

Brakfontein lies next to the main road between Delmas and Leandra surrounded by farmland and a wetland. Rain water flows from the mine, onto the road and into the Wilge River 30 metres on. No water capture by the mine occurs and Acid Mine Drainage (AMD) is certain. Water and mud could cause accidents but it also impacts on a farmer’s borehole next to the river, while informal settlement dwellers and cattle drink the water nearby. However, before 2016, the DWS had never performed water audits despite complaints.³²

Busy farmers complained of time consuming collection of evidence of transgressions to forward to the DWS. They felt agriculture was not a government priority despite its critical economic role and importance for food security.³³

3.2.3. Mine rehabilitation: majors and juniors

A critical part of a mining licence is rehabilitation. Despite Delmas being a new frontier of extraction, abandoned and unremediated mines belonging to juniors and majors are in evidence.

The abandoned junior Welgelegen mine is owned by Iyanga Coal which supplied Eskom.³⁴ It opened in 2009 and closed in 2014. Farmers protested to the DMR that no closure plan existed, ‘We asked the DMR is the waste dam Ok? Is it lined properly? Is it big enough? Is there disposal of waste on the wetland and isn’t the dump burning? But the DMR said everything was fine... They accused us of not going to the mine when there are problems and that we just run to the DMR.’³⁵ Topsoil had mixed with coal discard making agriculture impossible while windswept ash from a dump had destroyed the wetland. Rain flowed over the discard dumps into an outside dam which overflowed into the wetland and Wilge River below. The mine admitted to farmers it had no disposal plan, that dumps were burning, and that they had filled pits with ash.³⁶

Meanwhile Iyanga consulted the Delmas community on a licence for

a second mining project adjacent to Welgelegen. Farmers, refused permission to inspect the mine, took drone images and when the mine boasted of Welgelegen’s satisfactory restoration they produced them. Iyanga admitted in writing that the wetland had been destroyed but it would restore it.³⁷ The mine however has not been remediated and continues to contaminate surrounding water resources.

Farmers are concerned that the PCD wall has ruptured as it was not constructed to specifications. Sulphuric water flows down gulleys into the wetland which releases water into the Wilge. The dam should be constructed to guidelines for a 50–100 year flood line³⁸ to ensure it contains possible overflow. But commented a farmer, ‘What if they have disappeared by then?’³⁹

Close to Welgelegen lies another abandoned mine (possibly Shanduka Coal).⁴⁰ Rain flows over discard dumps forming deep gulleys into a large wetland bordered by maize fields.

DC is also a rehabilitation offender. Close to the Wilge River on mine property lie hills of coal discard, hardened overburden, and mining pits sporting green water. These are unremediated workings from the 1960s. They are the responsibility of the mine’s previous owner, Ingwe (BHP Billiton), which sold to DC and did not remediate. Nobody takes responsibility, including the state, which is barely managing the AMD⁴¹ fallout from gold mines on the West Rand.⁴² Downstream the European Union has threatened to discontinue agricultural imports around the Loskop Dam, representing billions of Rands in income and thousands of jobs in food production, owing to cyanotoxins in the water due to coal mining.⁴³

4. Water regulations & policies

The Delmas study reveals mines’ evasion of water regulations, in the process destroying agricultural land and food and water resources. A brief history of water laws explains some of this regulatory breakdown.

4.1. Transformation & conflict

Post-apartheid legislation delineated mining’s environmental responsibilities. This exposed tensions between laws governing the right to clean water and ownership of mineral resources and access to mining rights.

Through the MPRDA the state acquired custodianship of minerals to allow for equal access to mining. The mine licence effects this redistribution. Simultaneously mining environmental and water obligations were promulgated. Initially environmental duties fell under the MPRDA and a mining right was granted on the DMR approving an environmental plan and financial provision, held in trust by DMR, for post-mining rehabilitation. Thus mine closure was an integral part of obtaining a licence.

Contestation arose however when the DEA under the National Environmental Management Act (NEMA) published *activities* requiring industry, including mines, to get environmental authorisation. The DMR objected and invoked mining’s special status whilst the environmental department cited its constitutional oversight of mining’s impacts (Humby, 2015). This was later resolved through the One Environmental System or OES (see later). The NWA also required mines to obtain a

³⁷ Ibid

³⁸ A floodline on a contour plan shows the water level of a dam during flood conditions <http://www.sinske.com/AboutFloodlines.html> accessed 7.7.2016

³⁹ Interview Farmers A & B

⁴⁰ Ibid

⁴¹ AMD occurs in coal and gold mining. Crushed rock containing pyrites comes into contact with oxygen and a chemical reaction generates sulphuric acid of various strengths.

⁴² Interview Bashan Govender Acting Director Department of Water & Sanitation 6/7/2016 with K. Forrest & L. Loate

⁴³ <http://www.orangesenquak.com/river/water+quality/human+impacts/Microcystines.aspx> accessed 6.6.2016

²⁸ Interview Farmers A & B

²⁹ Interview Delmas farmers

³⁰ Interview former Brakfontein Engineer, Riaan Gilfillan with L. Loate 12.08.16

³¹ Ibid

³² ‘Complaines [sic] regarding Brakfontein mine licence’ Johan Gericke 9/02/2016 to DWS

³³ Interview Delmas farmers

³⁴ <http://quintonvanderburgh.com/iyanga-coal/> accessed 20/11/2016

³⁵ Interview Delmas farmers

³⁶ Ibid

WUL before mining (prospecting required no licence despite pollution and diversion of water resources).⁴⁴

Mining companies thus had to obtain multiple authorisations from different authorities. However confronted with delays and financial constraints most commenced mining without a WUL.

Licensing was complicated by the uncertainty of local government's powers over mining especially as it had to manage its impacts. The Spatial Planning and Land Use Management Act allows municipalities to decide on optimal land use and includes the power to object to a licence on the grounds that it pollutes water resources.⁴⁵

The Department of Agriculture (DAFF) can also refuse a land use which impacts on agriculture. Coal mining in Mpumalanga province encroaches on commercial farm land. In 2012, 250 000 hectares were under agriculture while one million was allocated to mining.⁴⁶ Observed a DAFF official,

... this is purely an administrative process. There's no consultation. The DMR manage the process. But downstream ...irrigation schemes are impacted by acid mine water and we're getting the pollution of landscapes... The landscape in Mpumalanga is changing from agriculture to mining.⁴⁷

Voracious mining has led DAFF to launch the Preservation and Development of Agricultural Land Bill to protect farm land and if passed it will demarcate protected agricultural areas where mining will be prohibited.

Where planning responsibility begins and ends for different government spheres has not been resolved through regulations or litigation and turf wars are common.⁴⁸

4.2. Regulatory failure: licences & appeals

Parliamentary questions (2009–2010) exposed the emptiness of transformative water laws. They revealed that in 2010 54 mines operated without WULs in Mpumalanga despite the DMR and DWS having powers to stop mining. In response to slow progress in issuing licences the DWS launched the Letsema Project to hasten the process (Centre for Environmental Rights, 2016, p 36). But licences are precise on prohibited impacts and fast tracking meant they were often shoddily assembled with WULs frequently omitting sites where water was impacted. A Keaton manager observed, '... water licenses have inaccuracies and inconsistent information so that they are practically unimplementable.'⁴⁹

Appeal procedures have been compromised and although suspension of mining pending an outcome is required, this seldom occurs. Moreover the Minister dismantled the Water Tribunal for several years and on being reconstituted it has sat only once since 2015 forcing parties to appeal to the courts or Minister (Centre for Environmental Rights, 2016, p 48). Mines also use NEMA's s24G(2) rectification loophole where if they transgress they can admit guilt, pay a fine, fix the damage and restart authorisation.⁵⁰

Regular audits to check compliance are impossible. A DWS official explained, 'It's ideal to inspect twice a year but ... we don't have the resources with the explosion of mines particularly in Mpumalanga.'⁵¹

⁴⁴ Ibid – a WUL was formerly issued by Water & Environmental Affairs but is now issued by DWS

⁴⁵ <http://www.customcontested.co.za/wp-content/uploads/2015/08/SPLUMA-Act-Booklet.pdf> accessed 6.6.2016

⁴⁶ Interview Lindeman

⁴⁷ Ibid

⁴⁸ For example T. Humby 'Conflict about coal mining in the Mabola Protected Area' Society Work & Development Seminar 9.5.2016; interview CoM Environmental Officer, Stephinah Mudau with K. Forrest 11.5.2016

⁴⁹ Interview Chetty

⁵⁰ http://www.gdard.gpg.gov.za/EMI/S24G%20Process/Section_24G-May_2009.pdf; Mail & Guardian 3.2.2017 accessed 12.2.2017

⁵¹ Interview DWS officials

Between 2004 and 2010 the DMR granted 4 700 prospecting and mining rights in Mpumalanga (Centre for Environmental Rights, 2016, p 61). Investigations of mine transgressions are mainly instigated when complaints are laid⁵² but few prosecutions transpire (Centre for Environmental Rights, 2016, p 58).

DWS' enforcement is problematic. Two officials checked results at hundreds of monitoring points in 2016 (Centre for Environmental Rights, 2016, VIII). In 2016 countrywide the DWS had seven inspectors empowered to investigate and recommend prosecutions in all categories of mining. In consequence few were prosecuted only ever resulting in a fine and never imprisonment (Centre for Environmental Rights, 2016). Prosecutorial authorities often misunderstand water laws and cases are dismissed.⁵³

4.3. Regulatory failure: mine closure

AMD effects are immediately felt with opencast mining as rainwater comes into contact with blasted rock. However AMD also features in underground mining where water through capillary action decants to the surface.⁵⁴ The mitigation of AMD and remediation of abandoned mines has become government's responsibility. South Africa in 2008 had 5 906 derelict mines – most in coal and gold and closure costs were estimated at R45.1 billion.⁵⁵ New laws however, prescribe a polluter pays principle whereby mines are responsible for their harmful externalities. However the abandonment or shoddy rehabilitation in coal has persisted due to insufficient funds in trust accounts, lax DMR monitoring, unlicensed operations, and companies' perception that externalised impacts are not their responsibility.

The DWS has not significantly intervened largely due to an inability to access remediation funds controlled by the DMR. Moreover NWA regulations contain no rehabilitation guidelines, 'We need a discussion between the two departments to cover aspects of closure ... There is a gap [in legislation].' commented a DWS official.⁵⁶ The DMR has granted licenses with no planning regarding aggregate impacts of mining on water. The water department addresses cumulative impacts in a new policy document where it expresses frustration with the lead role of the DMR. It advocates genuine cooperative governance (co-operation) between departments guided by the OES (Republic of South Africa, 2015, pp6, 7 & 9).

Yet another policy document despite multiple laws on licencing and water impacts which have not resolved the regulatory failure. State departments have been unable or unwilling to reconcile differences. Appeals to different authorities – the Minister, Water Tribunal, the courts – have proffered different outcomes largely ignored by the authorities. The messy legal regime is resolved by the authority holding power – the DMR. The law does not offer coherent guidelines to settle conflicts or effectively enforce legislation, resulting in Holston's description of Brazilian law that, '...became a misrule of law: a system of stratagem and bureaucratic entanglement, deployed by the state and subject alike to create invincible complication, obfuscate problems, neutralise opponents and, above all legalise the illegal (Holston, 2008).'

4.4. One environmental system

The OES (NEMA amendment 2014) underpins a Chapter 3

⁵² Ibid

⁵³ Ibid

⁵⁴ Interview Mccarthy

⁵⁵ Parliamentary portfolio committee briefing on mineral resources: Progress in dealing with derelict and ownerless mines, November 2014: <https://www.google.co.za/url?sa=t&rct=j&q=&esrc=s&source=web&cd=8&cad=rja&uact=8&ved=0ahUKewj7qp3yqavJAhWJ7xQKHfG8AbwQFghCMAC&url=http%3A%2F%2Fpmpg-assets.s3-website-eu-west-1.amazonaws.com%2F141112derelict.ppt&usq=AFQjCNFR2n5FnkQgnpf5M1dBZiXicdY14Q&sig2=B5q3B-C1jLMYsSw3C54Ogw&bvm=bv.108194040,bs.1,d.ZWU> accessed 20.10.2016

⁵⁶ Interview DWS officials

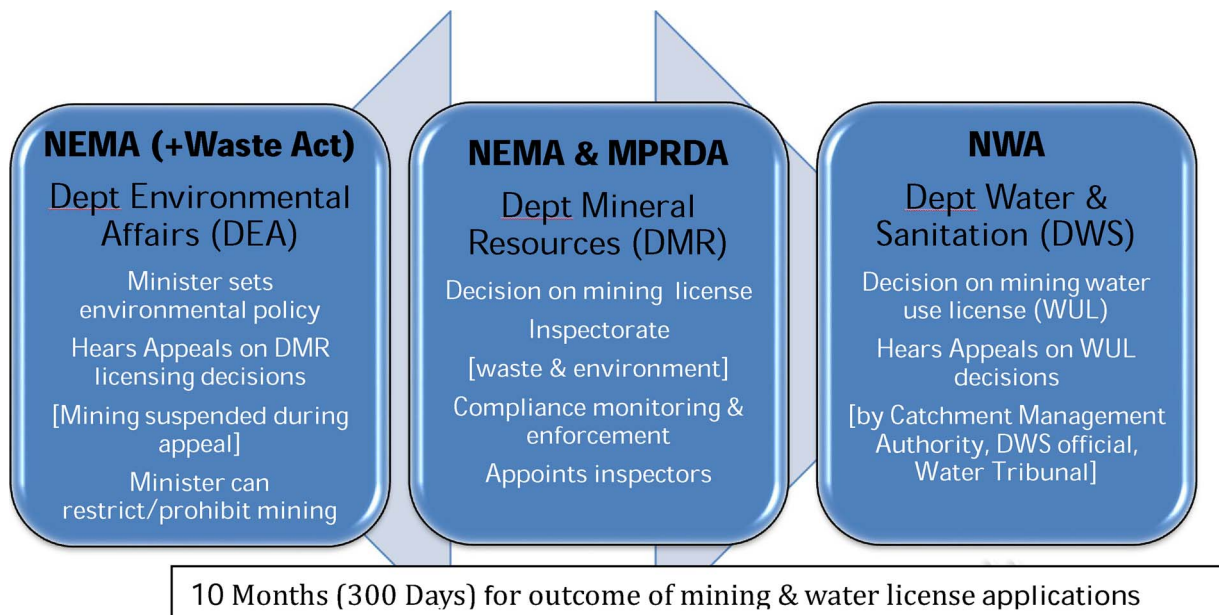


Fig. 3. ONE Environmental System (OES): Licensing & Monitoring.

Constitutional principle of cooperative governance where spheres of government must cooperate to make coherent decisions (Republic of South Africa, Constitution, 1996). It emerged from court action and political bargaining in a process of the DMR and DEA reaching a compromise. It aims to ensure that no one authority holds the power to develop and enforce regulations governing mining's environmental impacts which must be executed compliantly and in tandem.⁵⁷ At its centre lie three laws and departments which must cooperate to promote mining and protect water resources and the environment.

Under the OES the DEA develops laws, regulations and policies guided by NEMA. The DMR issues mining licences as well as being the monitoring, compliance and enforcement authority working through an inspectorate under NEMA and the MPRDA. Environmental plans and financial provision for closure is located in environmental law, NEMA, and not the MPRDA. The DMR must ensure sufficient finances to mitigate environmental damage (Fig. 3).

Licensing appeals are heard by the DEA under the OES and the environmental Minister importantly holds the power to prohibit mining in unmined areas and restrict further mining in sensitive environments. The DWS guided by the NWA remains the issuing authority for WULs. Licensing appeals are heard through the Water Catchment Management Authority, by a DWS official or the Water Tribunal.

All licensing processes must be completed within 300 days (under 10 months).

This compacted period however makes thoroughgoing investigation of mines' water impacts impossible yet the DMR is quick to issue licences.⁵⁸ A DWS official commented, 'We submit documents to the DMR on important environmental issues but it delays sometimes for months and then ...we ... have to respond in minimum six weeks.'⁵⁹ The time line signals a lack of intention on water matters. Commented a lawyer, 'It's a tick boxes exercise and this is having an even worse impact on the environment... In a case I know of 22 days after the submission of an EIA [Environmental Impact Assessment] the licence was granted after consideration of a 900 page document... No official could grant authorisation in so few days.'⁶⁰

The DWS, DAFF and municipal officials concurred that the DMR as the mining licence authority held most power. The DWS complained that the DMR often disregarded water matters, 'Not a single mine has been taken to court since the new legislation [OES] was in place whereas before we had a lot of cases with ... mining licenses.'⁶¹

Cooperative governance lies at the centre of the OES. However interdepartmental competition; dominance of the DMR; lack of contact, follow-up, numbers of mines and time constraints; differing aims and mandates; work cultures and complexity of issues; and personal and political interests all place constraints on its success.

Water specialist Anthony Turton recently stated that he 'knew of no mining organisation with a proper functioning water-use licence.'⁶² If the DMR ignores transformative laws the polluting of water will continue. And if the Minister fails to declare mining no-go areas, the poisoning of water resources and the farmlands they irrigate, will dangerously impact on South Africa's food security.

5. Conclusion

As extraction escalated, the DWS and DEA witnessed deleterious impacts on water. Such impacts are evident in other sectors of mining but are most evident in coal which has grown more rapidly than other sectors. This is chiefly because it is the cheapest form of mining for new black miners to enter (mainly opencast without to the requirement to sink shafts). Transformative laws have however exacerbated impacts. Companies mined without licenses including majors such as Shanduka, Exxaro, BHP Billiton and Anglo. Coal juniors also transgressed but not because they were favoured. Although benefiting from BEE laws and Eskom contracts the state does little to promote them. If anything majors have been preferred benefactors owing to their ability to concede 26% ownership to black companies. And where Eskom has ended majors' contracts, they have expanded their lucrative export market, largely inaccessible to BEE companies (Creamer Media Coal Report, 2015, p10).

Some argue that state officials ignore black juniors' water

⁵⁷ Interview Tracy-Lynn Humby with K. Forrest 18.04.2016

⁵⁸ Interview DWS officials

⁵⁹ Interview Govender

⁶⁰ Samantha de Villiers, Warburton Attorneys. 2016. 'The One Environmental System & Compliance and Enforcement by DMR' at Mining & Environmental Justice Conference.

(footnote continued)
26.07.2016

⁶¹ Interview Govender

⁶² <http://www.polity.org.za/article/acid-mine-water-quick-fix-possible-as-water-deficit-looms-oppenheimer-de-beers-told-2016-10-19> accessed 12.11.2016

pollution.⁶³ However most mines experienced WUL delays and *both* majors and juniors mined without fear of closure. Juniors struggle to meet some licensing condition costs, such as PCD linings, however some majors use poorly or unlined PCDs arguing that the 1956 Water Act overrides current laws.⁶⁴

No mine has been closed for breaking permit conditions.⁶⁵

The argument that BEE juniors are mainly responsible for AMD impacts is too simple. A trend has emerged whereby majors sell mines to juniors without rehabilitating partly because their operations sometimes predated post-apartheid laws. The responsibility to rehabilitate is transferred to new owners. Moreover DMR has poorly policed regulations allowing all mines to avoid closure responsibilities.⁶⁶

Juniors and majors elude laws but not always in the same manner. The Kuyasa and Masemani juniors indicated that a grey zone operates below the formal licensing regime. The majors also operate in this substratum but differently. They have the resources to traverse formal requirements but this may not be sufficient to ensure mining rights. They are vulnerable to changing political climates and so cultivate patronage relationships where favours and counter favours are traded. Such relationships reach into the upper echelons of state departments and beyond into the top political structures of the ANC. The majors negotiate this terrain through their power to dispense black ownership, mergers, joint ventures, equity stakes, royalties and other financial benefits and in this way bypass water regulations. They collude with the DMR's agenda and seldom protest at favouritism, lack of accountability, or manipulative deals as their silence allows for a profitable relationship.⁶⁷

What does regulatory failure mean? The outcome of cooperative governance should be responsible mining which protects water and ensures food security. Yet the opposite is unfolding in Delmas as mines extract rapaciously, the municipality moves to desertification, and further pollution of the Olifants River is underway.⁶⁸

Environmental laws are mostly sound but compliance and enforcement is lacking. The licencing failure is due to mines' negligent compliance and the state's weak monitoring. This places the DMR centre stage. It has not employed its power to equally benefit mining and the environment. It also has the contradictory mandate of promoting transformation and development of mining as well as protecting the environment from its ravages. Historically the former was its mandate thus when the law was amended it was not equipped with the expertise or incentive to enable the latter. The DEA conversely had been better prepared to perform the latter and had some success in calling extractives to account, but this is no longer its directive. Further it is unusual that the implementing authority did not develop the legislation. The DEA drafted laws which the DMR implements and neither understands the other's legal and policy regime.

A parallel politico-legal system operates as beyond the DMR's mandate lie political imperatives driving its disregard for water use. DMR officials' motivations for favouring mining varies from cronyism favouring individuals or mines; to securing jobs in the industry or

becoming mine owners themselves; to a nationalist class formation agenda buttressed by a BEE mandate to promote black capitalists); to the enjoyment of wielding power in an industry where big capital trumps all economic sectors.

The DWS stands in the DMR's shadow where it once had some independence from the mining lobby. It has been weakened by OES power relations and capitulates to the DMR. Although the DWS administers an inspectorate it was largely absent from water contamination sites in Delmas and its response to farmers' grievances was poor. This reflected a political and structural impotence (particularly in accessing rehabilitation funds, trained staff and good state adjudicators) where a demoralisation had developed in the face of an excess of mines. A DWS official noted,

DMR ... makes the final decision on whether a mine can operate. They don't communicate with us in the process. The DMR promotes mining so it's hard working together. Mines get the mining licence before the water-use licence usually. Sometimes the DMR sits on the application ... we have to keep to the days required. We have to comply with the law.⁶⁹

Although some state officials attempted to check mines' impunity they were blocked, overwhelmed or surrounded by indifference. Competing mandates, the absence of a unity of purpose, opaque and confused directives emanating from subterranean cronyism and political power mongering, undermined their actions. In this environment a breakdown of water laws' aspirational principles was inevitable. The regulatory system cannot resolve this impasse or enforce compliance as politics and power trump the legal mandate. This paralysis favours those with economic power – mining companies.

Where impunity exists there is resistance. In Delmas the fight back was conducted by white commercial farmers. They have economic and contributors' power, and the experience of elite citizenship under apartheid gives them confidence. They have challenged the DMR and DWS through complaints and legal means but although seemingly powerful, they are marginal. Their formal rights are overridden by substantive rights in the grey zone. Mines ignored complaints and paid lip service to consultation, so farmers relied on unresponsive state officials. (Ironically their weakness stems from ineffectual transformation of agriculture and land redistribution to black holders where, if this had occurred, water rights may have been protected.) A DMR official's response to a complaint about Mbuyelo mine receiving a WUL despite polluting a borehole was, 'You white people you don't want to see any other people in this country prosper.'⁷⁰ That farmers produce food does not lend them power. A repositioning of class fractions is occurring post-apartheid which weakens those who previously held power even if they now adopt a principled legal standpoint. White farmers are on the right side of the law but the wrong side of history and this renders water laws fragile.

Meanwhile mines manipulate, break or selectively implement laws and if challenged patronage and political influence is a means of wielding extra-legal power. They ignore complaints partly to force farmers to sell coal rich land. Thus a coercive encroachment dis-possession is made legal. South Africa's democracy runs parallel with impunity exposing citizens to the unpredictable exercise of power and incoherent application of laws. Mining is a land issue⁷¹ and it has destroyed swathes of agricultural land bringing pollution of water resources.

Does it matter if Delmas becomes a mining town? Delmas contributes to the important Mpumalanga food economy and mining has impacted on the whole Mpumalanga Highveld's productive capacity.⁷²

⁶³ Interviews Muhlbauer & Delmas Farmers

⁶⁴ Interview DWS officials: Deputy Director Water Resources Gauteng, Acting Director Regulation Gauteng, Acting Systems Director Gauteng, Deputy Director Control Regional Office in Directorate of Authorisation, Control Environmental Officer National Water Authorisation with K. Forrest & L. Loate 21.07.2016

⁶⁵ Coal of Africa had its Vele mine stopped for mining without a WUL

⁶⁶ Exceptions exist such as Anglo's eMalahleni Mine Water Reclamation Plant but uncertainly remains on its continuation after mines close.

⁶⁷ For example Glencore was strong-armed by the mining minister into selling its Optimum mine after Eskom refused to renew its contract in order to promote President Zuma's benefactor, the Gupta family's coal interests. Eskom's unusual upfront payment, raised the capital for the Guptas to purchase the mine. *State of Capture Report 2* <http://cdn.24.co.za/files/Cms/General/d/4666/3f63a8b78d2b495d88f10ed060997f76.pdf>

⁶⁸ Desertification is the process by which productive land transforms into wasteland <http://scienceheathen.com/2015/01/05/desertification-effects-causes-examples-top-10-list/> accessed 12.8.2016

⁶⁹ Interview DWS Officials

⁷⁰ Interview Delmas Farmers

⁷¹ MPRDA: Developmental Or Destructive? M. Hermanus, I. Watson & J. Walker, Society, Work and Development Institute, 18.9.2015

⁷² <http://lowvelder.co.za/283878/food-production-sees-dramatic-drop-in->

As the 2016 groundWork Report notes, ‘Much of the Highveld resembles the post-apocalyptic nightmare of an already dead and dying land.’ (Hallowes and Munnik, 2016, p5). DAFF views the raiding of Mpumalanga’s food production as so serious that it is considering removing massive quantities of top soil before mining to an area with similar conditions – a desperate, expensive and uncertain strategy.⁷³ Parts of the southern African region have been historically dependent on South Africa’s surplus maize production, much of which is produced in Mpumalanga, thus coal mining’s localised environmental damage holds consequences for both national and regional food security.⁷⁴

The short termism of the state and mining capital in pursuit of power and accumulation threatens all South Africans including the next generation who will inherit wastelands. The economic disempowerment inflicted by apartheid and limited wealth redistribution, has produced a post-apartheid generation greedy to accumulate regardless of consequences. In 2017 the DMR deputy director-general underscored the government’s policy incoherence when he stressed the need to mine coal more intensively because of its importance in the energy mix and in generating foreign exchange.⁷⁵ Mining is a decision about land and water use and the state has permitted coal energy to trump water resources, agriculture and food production and does not engage with choices.

The Delmas study demonstrates a disjuncture between policy and practice. The MPRDA dramatically increased mining and unintentionally its negative impacts and companies have used the state’s policy incoherence and failed regulations to their advantage. Farmers point to state-buttressed water grabbing⁷⁶ by extractives using legal, illegal and extra-legal means. Failed cooperative governance appears to be a deliberate state strategy to support mining activity over agriculture and clean water resources.

This study is a microcosm of the state’s priorities generally. The ANC gave birth to new laws which it undermines. There is some movement forward but this is accompanied by retrogressive steps and fragmentation. Social breakdown, including ecological collapse, cannot be engaged with by a state which is chiefly focused on upward mobility of a black elite.

As outlined in the introduction local and international studies exist which describe the impact of coal mining on water, some of which point to the failure of cooperative governance and water laws. This article which has highlighted impacts and regulatory failure in South Africa has taken the arguments beyond ecological factors into the realm of social relations.

In order to understand mining’s environmental destruction it is critical to examine the socio/political context. In South Africa a particular socio/economic path and attempts at redress are closely connected with the collapse of environmental laws. However in each country the deeper socio/political reasons for engaging in coal mining will play out in unique ways. Such important understandings need to be uncovered in countries across the globe as coal mining’s footprints aggregate to destroy the water supply of whole regions.

Why has a particular government adopted a coal energy or export path? Who else is advocating for such energy? Is there collusion? What are their interests? How are laws being blocked or subverted? Is there a subterranean grey zone which sanctions this? Whose interests are being suppressed and why? These questions are fundamental to understanding why environmental devastation takes place. However there is

(footnote continued)

mpumalanga/accessed 12.1.2016

⁷³ Interview Lindeman

⁷⁴ http://awsassets.wwf.org.za/downloads/facts_brochure_mockup_04_b.pdf

⁷⁵ http://www.miningweekly.com/article/junior-mining-sector-must-be-supported-coal-to-remain-key-to-s-africas-energy-needs-dmr-2017-02-02/rep_id:3650 accessed 18.3.2017

⁷⁶ Water grabbing refers to actors capturing decision-making around water which impacts on ecosystems on which livelihoods are based. <https://www.tni.org/en/publication/the-global-water-grab-a-primer> accessed 20.10.2016

a dirth of international literature that examines these underlying social imperatives. Unless the socio/political context is unpicked it will not be possible to understand why environmental destruction persists.

This article has contributed to the international literature by demonstrating the importance of uncovering fundamental social issues which cause environmental destruction. Unless they are understood it will not be possible to advocate for change or to intervene at particular points, or in particular ways, to prevent the destruction of the world’s natural resources.

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Referees

1. Emeritus Professor Terence McCarthy School of Geosciences University of the Witwatersrand Terence.Mccarthy@wits.ac.za
2. Dr Victor Munnik: Independent Researcher for Water, Climate and Environmental Justice; Associate Researcher, Institute for Water Research, Rhodes University. victor@victormunnik.co.za
3. David Hallowes: Author & Researcher: groundWork & Friends of the Earth South Africa. hallowes@telkomsa.net
4. Dr David Fig: Honorary Research Associate Environmental & Geographical Science University of Cape Town. Email: davidfig@iafrica.com

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References

- Auyero, J., 2007. *Routine Politics and Violence in Argentina*. Cambridge University Press, New York.
- Altieri, K., Trollip, H., Caetano, T., Hughes, A., Merven, B., Winkler, H., 2015. Pathways to Deep Decarbonisation in South Africa. Sustainable Development Solutions Network and Institute for Sustainable Development and International Relations, Cape Town.
- Ashman, S., Fine, B., The Independent. December 2015.
- Baker, L., Burton, J., Godinho, C., Trollip, H., 2015. *The Political Economy of Decarbonisation*. Energy Research Centre. University of Cape Town, Cape Town.
- Bebbington, A., Williams, M., 2008. Water and mining conflicts in Peru. *Mountain Res. Dev.* 28 (3/4), 190–195.
- Burton, J., Winkler, H., 2014. *South Africa’s Planned Coal Infrastructure Expansion*. Energy Resource Centre University of Cape Town, Cape Town.
- Cargill, J., 2010. *Trick or Treat Rethinking Black Economic Empowerment*. Jacana Media, Johannesburg.
- Casey, T.L., Mitchell, D.W., 2013. Has EPA’s war on coal stalled? *Nat. Resour. Environ.* 27 (3), 20–24.
- Centre for Environmental Rights, (2016). *Zero Hour*.
- Centre for Sustainability in Mining & Industry, (2010). *Sustainable development of the Waterberg Coalfields Report 1 of 2*. August 2010.
- Colaguiri, R., Morrice, E., 2015. Do coal related health harms constitute a resource curse? a case study from Australia’s Hunter’s Valley. *Extract. Ind. Soc.* 2 (2), 252–263.
- Competition Tribunal of South Africa. 2016. Case no. LM212Jan16. January 2016.
- Comrie, S., (2016). *Tegeta Coal Quality Hopelessly Non-compliant, Says Report*. Amabhungane Centre for Investigative Journalism. 30 August 2016.
- Cremer Media Coal Report, (2015). *Coal August 2015*. Cremer Media. Johannesburg. Die Beeld, 4.11.2010.
- Die Beeld, 6.6.2012.
- Delmote, C., 2016. *Small Scale Gold Mining, Mercury Exposure and the Struggle for the Right to Water in the Peruvian Amazon*. *Alternautas* 3 (2), 52–69.
- Dupuits, E., Garcia, M.M., 2016. *Water and (Neo)Extractivism in Latin America*. *Alternautas* 3 (2), 4–11.
- Eberhard, A., 2011. *The Future of South African Coal*. Programme on Energy and Sustainable Development. Stanford University. Working Paper 100.
- Exxaro Resources, 2015. *United Nations Global Compact: Communication on Progress*.
- Fatah, L., 2008. *The impacts of coal mining on the economy and environment of South*

- Kalimantan Province, Indonesia. *ASEAN Econ. Bull.* 25 (1), 85–98.
- Groenewald, Y., 2012. Coal's Hidden Water Costs to South Africa. Greenpeace Africa, Johannesburg.
- Israel, D.H., 1981. Western coal mining in the 1980: a study in federal/state conflicts. *Nat. Resour. Law* 13 (3), 581–612.
- Hallowes, D., Munnik, V., (2016). *The Destruction of the Highveld: Digging Coal. Groundwork.* Pietermaritzburg. November 2016.
- Holston, J., 2008. *Insurgent Citizenship.* Princeton University Press, Princeton & Oxford.
- Hota, P., Behera, B., 2015. Coal mining in odisha: an analysis on impacts on agricultural production and human health. *Extract. Ind. Soc.* 2 (4), 683–693.
- Humby, T., 2015. One environmental system. *J. Energy Nat. Resour. Law* 33 (2), 110–130.
- Kasl, B., (2013). *Brakfontein 264 IR Colliery Extension: Scoping Report.* Cabanga Concepts. July 2013.
- Keaton Energy, (2015). *Annual Report.*
- McCarthy, T.S., Pretorius, K., 2009. Coal mining on the highveld and its implications for future water quality in the Vaal River system. In: *International Mine Water Conference Proceedings.* 19–23 October 2009 Pretoria.
- Merriam, E.R., Petty, J.T., Strager, M.P., Maxwell, A.E., Ziemkiewicz, P.F., 2013. Scenario analysis predicts context-dependent stream response to land use change in a heavily mined central Appalachian watershed. *Freshw. Sci.* 32 (4), 1246–1259.
- Mishra, N., Das, N., 2017. Coal mining and local environment: a study in Talcher coalfield of India. *Air Soil Water Res.* 10, 1–10.
- Mishra, S.K., Mishra, P., 2017. Do adverse ecological consequences cause resistance against land acquisition? the experience of mining regions in Odisha regions, India. *Extract. Ind. Soc.* 4 (1), 140–150.
- Mitchell, G., Granville, A., 2002. *Research Report 1: The Development of a Junior Mining Sector in South Africa.* Minerals & Energy Policy Centre.
- Mitchell, G., Sakoane, M., (2002). *Research Report 2 for Samda.* Revised September 2002.
- Nealer, E.J., Van Eeden, E.S., Van Niekerk, D., Tempelhoff, J.W.N., 2011. Geohydrological issues of importance in the area governed by the Delmas local municipality. *Politeia* 30 (3).
- Olem, H., 1983. Coal and Coal Mine Drainage. *Water Pollut. Control Federation* 55 (6), 701–705.
- Pimentel, D., Fast, S., Wei, L.C., Stuart, E., Dintzis, J., Einbender, G., Schlappi, W., Andow, D., Broderick, K., 1982. Water resources in food and energy production. *Bioscience* 32 (11), 861–867.
- Peng, Q., 2011. Effect of coal mining on karst groundwater in the Fengfeng coalfield. *Energy Explor. Exploit.* 29 (6), 843–856.
- PriceWaterhouseCoopers, (2016). *SA Mine 8th Edition: Highlighting Trends in the South African Mining Industry.* September 2016.
- Rapp, J., 2011. Coal and water: reclaiming the clean water act for environmental protection. *Tulane Environ. Law J.* 25 (1), 99–154.
- Republic of South Africa, 1996. *Constitution of the Republic of South Africa.*
- Rodriguez-Labajos, B., Martinez-Alier, J., 2015. Political ecology of water conflicts. *WIREs Water* 2 (September/October), 537–558.
- Roger, J., James, C., Maslowski, R., (2008). *Importing Pollution: Coal's Threat to Climate Policy in the US Northeast.* Union of Concerned Scientists. December 2008.
- Sangi, E., 2010. Equating stream structure with function: The Fourth Circuit's Misstep in *Ohio Valley Environmental Coalition v. Aracoma Coal Co.* *Ecol. Law Q.* 37 (2), 701–709.
- Scott, S.L., McSpirit, S., Breheny, P., Howell, B.M., 2012. The long-term effects of a coal waste disaster on social trust in Kentucky. *Organ. Environ.* 25 (4), 402–418.
- Straskaba, V., 1983. Ground-water as a Nuisance. *Geojournals* 5 (5), 445–452.
- Tan, D., Feng Hu, Thieriot, H., McGregor, D., 2015. *Towards a water and energy secure China: Tough Choices Ahead in Power Expansion With Limited Water Resources.* China Water Risk.
- Transparency International, 2009. *The anti-corruption plain language guide.*
- Wishart, R., 2012. Coal River's Last Mountain: King Coal's Après moi le deluge Reign. *Organ. Environ.* 25 (4), 470–485.