



## Acid mine drainage for Witwatersrand Gold Mines: Environmental law remedies available to regulators and civil society

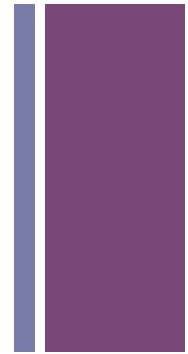
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# Overview

- What is acid mine drainage?
- Scope and urgency of AMD problem in South Africa
- Environmental enforcement tools for regulators
- Environmental law remedies for civil society
- Liquidation and abandoned mines



# + What is AMD?

- AMD results from the **oxidation** of **sulphide minerals** in mine orebodies, such as pyrite, exposed by mining → results in **acid water** that **dissolves heavy metals**, can also become **saline** when AMD is neutralised through its reactions with rocks
- Mine water contains toxic heavy metals dissolved by the acid water, including manganese, aluminium, iron, nickel, zinc, cobalt, copper, radium and uranium — all with **varying degrees of toxicity**, and **radioactivity** in the case of radium and uranium
- Where has this problem come from, here and elsewhere?



# + Scope and urgency of the problem



- Water pollution and threats to ecosystems (climate change)
- Health impacts for downstream water users
- Soil pollution and ground instability
- Threats to heritage sites
- Mine health & safety
- If pumping stops in Witwatersrand Basin, the mine void could fill within 36 months

## + Scope and urgency of the problem (cont.)



- DWAf Water for Growth & Development Framework Ver 7, 2009:
  - “present and immediate” threat in the central and western basins of the Witwatersrand mine systems that requires “urgent intervention”
  - “As a consequence of the absence of operational pumping facilities, the Central Basin has flooded to within 900m of the surface, threatening the perched aquifer above the AMD. Various studies predict that the AMD will entirely decant into the central basin within three and half years. This situation not only represents a potential environmental catastrophe, but threatens the structural integrity of the Johannesburg City Centre.”
- Mining Weekly: “single most significant threat to SA’s environment” (May 2009)
- Many NGOs have raised the alarm: FSE, Earthlife



# Are there technical solutions to AMD?

- Yes, but expensive
  - Lime neutralisation: passive limestone drain
  - Carbonate neutralisation
  - Electrodialytic ion exchange
  - Constructed wetlands
  - Precipitation of metal sulfides



## + Enforcement tools for regulators: Corrective action by environment authorities

- NWA s.19(1): Owner of land, a person in control of land or a person who occupies or uses land on which (a) any activity or process is or was performed or undertaken; or (b) any other situation exists, which causes, has caused or is likely to cause pollution of a water resource, must take all reasonable measures to prevent any such pollution from occurring, continuing or recurring.” S.19(3) directive. Cost recovery. Interdict s.155.
- NEMA s.28(1), also read with NEMA s.28(1A): “significant pollution or degradation of the environment”. Cost recovery, now even *before* incurred s.28(8). S.28(7): can approach court to enforce.
- Also emergency incident provisions NEMA s.31 and NWA s.20, though may not qualify as “unexpected sudden occurrence”

## + Enforcement tools for regulators: Corrective action by environment authorities (cont.)

### ■ Harmony Gold case SCA 2006

- NWA S.19(3) directives issued to Harmony, AngloGold and others (NEMA s.28(4) pre-directive)
- Appeal against review application decision in WLD
- Howie, JA: “The situation we have here is one where the various mines concerned have been required to join forces in continuing with a dewatering process already physically under way but insufficiently funded. I cannot see that it is outside the scope of ‘reasonable measures’ to require this collaboration and to require the companies concerned to share the expense of it. That is what the directive in issue demanded and in my view the first respondent was empowered by s 19(3) (read with s 19(1)) so to demand.”



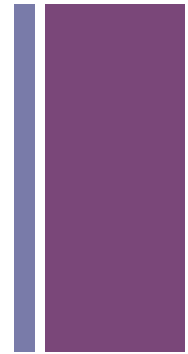
## + Enforcement tools for regulators: Corrective action by mining authorities

- MPRDA s.38(1)(d): general obligation on holder of mining right to rehabilitate the environment “to its natural or pretermined state or to a land use which conforms” to sustainable development
- MPRDA s.38(1)(e): holder of mining right responsible for environmental damage, pollution or ecological degradation in and outside area of mining
- MPRDA s.38(2): jointly and several liability for diectors for any unacceptable negative impact on the environment, whether “advertent” or “inadvertent”
- MPRDA s.41: Applicant for mining right must make “prescribed financial provision for rehabilitation or management of negative environmental impacts”. Must annually be assessed and increased “to the satisfaction of the Minister”. Remains in force until closure certificate issued, and even then Minister can retain portion of provision.



# + Enforcement tools for regulators: Corrective action by mining authorities

- Detailed Guideline on calculation of financial provision, Regulation 36
- MPRDA S. 45 If urgent remedial measures are required, Minister can issue directive to permit holder; if fails to comply, Minister can take necessary measures. Minister can apply ex parte to High Court to seize and sell property of permit holder to cover expenses.
- MPRDA S.47 Minister can suspend or cancel mining permit



# + Enforcement tools for regulators: Punishment

- No administrative penalties – criminal prosecution only
- Punishment for non-compliance with directives
  - DWAF in WFGD [Referring to the 2006 directive to Harmony, AngloGold and others]: “Despite significant investment by the mines in treatment facilities, the water standards specified in the directive have not been met and partially treated water is currently discharged into the Tweelopies Spruit. This situation has already resulted in the contamination of downstream boreholes and other environmental damage and if continued is likely to result in significant claims for compensation.”
  - Criminal offence under NWA (s.151): 1st offence R100 000 or 5 years, 2<sup>nd</sup> offence R200 000 or 10 years
  - Now also criminal offence not to comply with NEMA S.28 directive (s.28(14)(c)): R1m or 1 year

# + Enforcement tools for regulators: Punishment (cont.)



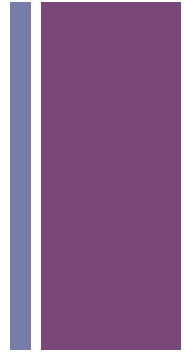
## ■ Punishment for pollution

- NEMA s.28(14): fault-based criminal offence to significantly pollute or degrade environment, or significantly detrimentally affect environment
- NWA s.151: fault-based criminal offence to pollute or detrimentally affect water resource
- Some issues with some of elements of crime, e.g. unlawfulness and mens rea
- Example from US: Paul Thomas and T&T Fuels Inc
- What about common law crimes like murder, culpable homicide or malicious damage to property?



# For Release: April 25, 1997

## Acid Mine Drainage dumped in West Virginia waters



Paul Thomas of Morgantown, W.Va., **president and co-owner** of T&T Fuels Inc., now out of business, **pleaded guilty** in U.S. District Court in Elkins, W.Va., on April 18 to one **felony** count of violating the Clean Water Act by discharging millions of gallons of acid mine drainage in violation of state and federal permits. Thomas pleaded to discharging untreated and partially treated acid mine drainage from the T&T Fuels #2 Mine in Albright, W.Va., into Muddy Creek which flows into the Cheat River. The discharge took place in April 1994 **when a containment structure failed**, releasing the mine drainage into the creek. A similar containment structure “blowout” occurred at a second T&T mine in March 1995. Thomas faces a maximum sentence of **three years imprisonment and/or a fine of up to \$250,000**. The case was investigated by EPA's Criminal Investigation Division, the FBI and the West Virginia Division of Environmental Protection.

# + Enforcement tools for regulators: Disaster management

## ■ Disaster Management Act, 2002

- “disaster” defined as “a progressive or sudden, widespread or localised, natural or human-caused occurrence which (a) causes or threatens to cause (i) death, injury or disease; (ii) damage to property, infrastructure or the environment; or (iii) disruption of the life of a community” and (b) is of a magnitude that exceeds the ability of those affected by the disaster to cope with its effects using only their own resources”
- But s.2(1) does not apply if occurrence can be dealt with effectively in terms of other national legislation
- Wide powers

# + Why are regulators slow to use enforcement tools?

- Overall lack of compliance and enforcement policy and strategy in relation to AMD
- Too many cooks complicate the broth
- Not always publicised
- Civil remedies:
  - Lack of appropriate legal skills within Departments
  - Risk-averse approach of Legal Services within Departments
  - Lack of appropriate support from State Attorneys
  - Lack of political support from senior management
- Criminal prosecution:
  - Too few officials with criminal investigation skills
  - Lack of interest and support from prosecutors
  - Lack of political support from senior management



# + Environmental law remedies for civil society: Getting regulators to use enforcement tools

- NEMA s.28(12)
- No similar provision in NWA or MPRDA – does not mean regulator cannot be put on notice
- Approaching court for mandamus: NEMA S.32(1): “Any person or group of persons may seek appropriate relief in respect of any breach or threatened breach of any provision of this Act, including a principle contained in Chapter 1, or of any provision of a specific environmental management Act, or of any other statutory provision concerned with the protection of the environment or the use of natural resources”
- MPRDA financial provision – access to information



# + Environmental law remedies for civil society: Action against mining companies

- Class action suits for “appropriate relief” - NEMA S. 32(1)
- Delictual claims for damages by communities and enterprises downstream of mines
- PAIA

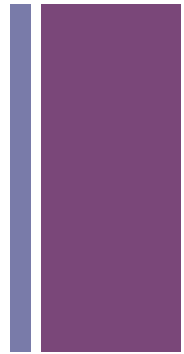


## + Environmental law remedies for civil society: Punishment

- Criminal prosecution: lay charge with SAPS
- NEMA S.33 private prosecution: cannot be asked for security, and do not need notice from NPA declining to prosecute if given 28 days notice and NPA has not decided to prosecute
- Similar problems with elements of crime

# + Why does civil society not use any of its remedies?

- Lack of knowledge of legislation, lack of access to legal advice
- Lack of funding
- Past negative experience of litigation
- NGOs and CSOs are thinly spread
- CER, NERF and Environmental Rights Pilot Projects



# + Pamodzi Gold<sup>10</sup>: Risks of insolvency and/or large-scale abandonment

- Often trigger for government action: emergency
  - Buffelsfontein in KOSH basin
  - Pamodzi Gold on East Rand (R2,5m/month pumping subsidy after provisional liquidation)
- Business rescue provisions in new Companies Act – still have problem of funding
- Need far more rigorous assessment and control of financial provision
- Are we already at the point where a Superfund is required?

# + Summitville Superfund Site, Colorado, US



- 1870: Gold mining starts
- 1986-1991: Summitville Consolidated Mining Corp., Inc. operated a pit heap leach gold mining operation, using cyanide to extract gold
- 1992: Summitville abandons site after declaring bankruptcy
- Contaminated with heavy metals (i.e., copper, cadmium, manganese, zinc, lead, nickel, aluminum, iron) on site. Downstream of the site, surface water quality heavily degraded with heavy metals, especially copper, and AMD.
- 1992: EPA Emergency Response Branch assumed responsibility of the site
- 1994: Placed on the National Priorities List of Superfund sites.

## + Summitville Superfund Site, Colorado, US (cont.)

- 2008: Start construction on hydroelectric plant as part of a series of construction projects to improve control of snowmelt and storm water runoff at the site. Power from the plant will be sold back to electricity provider, reducing the energy cost of contaminated surface water treatment by 40%.
- 2009: Received \$10 to \$25 million in new funding through stimulus package to construct a 1600 gallons-per-minute water treatment plant at site: remove contaminants from AMD before the water leaves the site and enters the headwaters of Alamosa River, which flows into Rio Grande.
- Overall cost of \$200 million to \$250 million to clean, cap, plug and dike the site
- Superfund has been funded through taxation – suffers from political ebb and flow (\$600m from 2009 stimulus package)
- Criticism: slow, too expensive, politically motivated
- Achievements: has cleaned up 260 heavily polluted sites and more than 580 sites with lesser pollution worries in US





# Conclusions



- AMD is price of 125 years of interference with natural systems
- Not bunny-hugging: about drinking water and structural integrity
- Regulators have wide range of enforcement tools, but are not yet using these to their full potential
- Civil society has a range of remedies against both regulator and mining companies, but is hampered by lack of legal knowledge and funding
- Access to information, particularly in relation to financial provision – allows informed government decision on superfund