SLOW POISON: AIR POLLUTION, PUBLIC HEALTH AND FAILING GOVERNANCE

A story of air pollution and political failure to protect South Africans from pollution

June 2014

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Preface

This report is produced as we pass the twenty-year mark of democracy. It shows how our democracy has failed to protect people from corporate pollution and how government's failure to deliver clean energy to people results in them relying on dirty fuels.

In our democracy, people are still polluted and made sick by this pollution. Many who live in the pollution hotspots are unable to get such jobs as are on offer because they cannot pass the health test. The corporations need healthy labour, and they still use the migrant labour system to get it from far away. Those who do get the jobs are put to work in environments which will probably kill them, even if they start healthy. And these jobs keep the pollution pumping out across local settlements and the broader region.

The story of air pollution is a very personal story of people who struggle to sustain the most basic process necessary to stay alive – breathing. At the Settlers Primary School in south Durban, 52% of young learners have asthma. That is what happens when you live and go to school between two oil refineries that constantly spew toxins into the air you breathe. So the fight for clean air, free from pollution, is a fight for health. The struggle for credible air pollution legislation was a struggle to take hold of the constitutional right that everyone has "to an environment that is not harmful to their health or well-being".

We have often heard that we are not all equal – or that some are more equal than others. The way our governments collectively deal with development at the global scale bears testimony to this. In 1991, Larry Summers, then of the World Bank and more recently head of Barack Obama's National Economic Council, argued for dumping dirty industry and toxic waste in the South because the South is under-polluted and poor people die early anyway. He made explicit the double standards that operate globally. The way Shell operates in the Niger Delta and south Durban would never be accepted in Europe. Former Eskom boss Jacob Maroga seems to have reflected the sentiments of the new South African elite when he echoed Summers' thought. He argued that Medupi

did not need pollution abatement equipment because the Waterberg area was under-polluted. Medupi will certainly put that right. We believe to the contrary that all people everywhere are equal and must enjoy the same rights.

This report reflects on the lawlessness that developed under apartheid and gave companies a "licence to pollute" with impunity. Corporate bosses knew they were untouchable. But this was challenged during the early democratic era. Community people living next to polluting industry started linking across townships and suburbs, across towns and provinces and across countries. They questioned the condition of the polluted air they were forced to breathe and challenged those who polluted it.

This report comes at a time when Eskom, Sasol, Shell, Engen and various other companies are seeking exemptions and/or postponements from meeting emission standards required by the Air Quality Act and debated in stakeholder forums over the last five or six years. Eskom is a state-owned corporation and, as state lawyers presently interpret the law, cannot be sued by another organ of state. It seems that it is the corporate battering ram set up to wreck emission standards. If its application for postponement succeeds, all private corporations will follow it through the wide breach made in the law.

This report documents the collapse of air quality regulation in South Africa. It comes out as the country has just gone to the elections, and we hope that the incoming politicians at all levels will understand the urgency of the situation. We hope that they will consider what the continuation of an agenda that serves the global elite means for the health and well-being of the people who live in the smoke. We know that officials responsible for air quality struggle with limited resources and many struggle to come to terms with what they are supposed to be doing and why. We hope this report provides some clarity. Our history, however, gives little evidence that our government is about to do the right thing. So, finally, this report is written for the people living on the fencelines of polluting industries. We hope it proves a useful resource in the struggle to breathe and to make a world where everyone can look forward to a good life, where we can all live well with each other and with the earth.

Acknowledgements

Thanks to the team of writers from groundWork and the Centre for Environmental Rights. Everyone has put in extra time to make sure that we get it right. The report is produced in collaboration with organizations from the pollution hotspots. Thanks to Caroline Ntaopane and Samson Mokoena from the Vaal Environmental Justice Alliance, Thomas Mnguni from the Greater Middelburg Residents Association and Des D'Sa and Bongani Mthembu from the South Durban Community Environmental Alliance, who helped conceive the report and commented through several versions.

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1. Air quality in context

David Hallowes

South Africa's economy is dominated by the minerals-energy complex. This has made for a highly concentrated economy – one in which wealth and the power to direct development is held by a very few large corporations. The concentration of economic power in South Africa has led to one of the most unequal economies in the world and also one of the most energy, carbon and pollution intensive.

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Unequal South Africa

Income inequality has intensified since the first democratic elections in 1994. Levels of poverty are extreme and poverty is still defined by race, class, gender and geographical location. Thus the poorest people are rural women living in the former Bantustans. Between 2000 and 2008, the richest 10% of South Africans increased their share of income at the expense of everyone else (Leibbrandt et al. 2010: 26). The bottom 60% got only 11.4% of all household income in 2008 while the poorest 20% got a mere 1.4%.

These figures refer only to household inequality, to what the Constitution calls "natural persons". It does not refer to "juristic persons" – that is, to corporations. Since 1994, South Africa's biggest corporations have listed on the London and New York stock exchanges, taking very large sums of capital with them, while more foreign investors and speculators are taking home profits and royalties from money made in South Africa. Global inequality is even higher than inequality in South Africa, and part of the difference is made up by South Africa's contribution to the global rich.

Increased government spending on welfare grants – pensions, child support, disability grants and so on – has "alleviated" poverty, but not necessarily reduced it. In 2007, government also claimed rising employment but, by that time, escalating food and fuel prices had ripped into any benefit from "positive income growth". In 2008, economic depression evaporated jobs.

At the end of 2012, the official unemployment rate was 25%. People are counted as employed so long as they receive some money for doing something, even if it is temporary, part-time, casual or informal. People who beg on street corners are counted as employed. The "expanded" unemployment rate includes those who have given up looking for work. That stands at 36%.[1] The real unemployment figure is higher still. Only 40% of South Africans between fifteen and sixty-five years old are employed. Some are otherwise occupied, for example in studying or looking after children, but many are simply excluded from the "labour force" figures.

Poor South Africans spend 21% more than they earn according to the Bureau of

1 Paul Berkowitz, *The meaning of numbers: Labour Force Survey, Q4*, Daily Maverick, 6 February 2013.

Economic Research (Masemola et al, 2012). The better part of their income is spent on food, housing and energy. Working or not, increasing numbers of South Africans rely on debt to live. Much of their income is intercepted before they see it, so they are driven ever deeper into debt.

In August 2012, thirty-four striking mineworkers were killed by police at Lonmin's Marikana platinum mine. The massacre exposed the brittleness and brutality of the post-apartheid economic order. The Lonmin strike was one of a series of wildcat strikes across the mining sector that demonstrated the alienation of workers from the labour regime and from the unions supposed to represent them. The strikes revealed that the mines still rely on migrant workers who live in appalling conditions in shack settlements or run-down hostels. Many of the jobs have been casualised, so they work day to day at the mercy of labour brokers who take their cut of the wage while the loan sharks take another large slice. Local communities see little benefit by way of jobs and substantial costs by way of pollution, dispossession and social disintegration. The mining strikes were followed in November by wildcat strikes by non-unionised seasonal farmworkers in the Western Cape. Here the development of the most "dynamic" agricultural region in the country – that is the region that has shown the greatest economic growth – has dictated extreme deprivation and rising debt. There are jobs to be had on the mines and on the farms, but the conditions of work do not alleviate poverty but rather entrench it.

Fossil carbon economy

South Africa's carbon intensity and high emissions result from two fundamental and related reasons – its reliance on coal as its primary energy source and its policy of sup-

Table 1: Primary and final energy in South Africa in 2006

	Primary energy		Final energy	
	Petajoules	**%**	**Petajoules**	**%**
Total	5,644	**100.0**	**2 705**	**100.0**
Coal	3,721	66.0	730	27.0
Crude oil	1,214	21.5	n/a	n/a
Renewables*	428	7.6	189	7.0
Natural gas	160	2.8	108	4.0
Nuclear	109	1.9	n/a	n/a
Hydro	11	0.2	n/a	n/a
Electricity	n/a	n/a	768	28.4
Liquid Fuels	n/a	n/a	911	33.6

Compiled from *The Digest of South African Energy Statistics* (DoE 2009).

* The figures for "renewables" are accounted for by biomass from sugar and wood-pulp wastes used to generate energy for sugar and pulp mills, and from firewood used for domestic energy. In the first case, plantation production is not sustainable. In the second, wood stocks are being depleted. Neither qualifies as "renewable".

plying cheap and abundant electricity to industry.

Table 1 is based on the latest statistics available from the Department of Energy – the 2009 *Digest of South African Energy Statistics* which gives statistics only to 2006[2] – and shows where the energy comes from. Primary energy is the original source of energy. Final energy is the form in which energy is actually used. The table shows both the absolute amount of energy in petajoules (PJ)[3] and the proportion of energy (percentage) supplied from each source.

> South Africa is the biggest source of emissions in Africa and it is ranked twelfth in the world.

In 2006, South Africa's total primary energy supply came to 5 644 PJ. Sixty-six percent of this energy came from coal, the dirtiest possible source of energy. It is used in three ways: it is converted into electricity by Eskom; it is converted into liquid fuels and chemicals by Sasol; or it is used directly as "final energy" in industrial processes. The best quality coal is exported. Imported crude oil is the next largest source of primary energy and South Africa's largest import item. Oil is mostly converted into liquid fuels by the oil refineries.

The final energy available for use comes to 2 705 PJ. This means that nearly half the primary energy is lost in the process of converting it into electricity and liquid fuels. A large proportion of the lost energy literally goes up in smoke through the chimney stacks at the power stations and refineries.

Cheap electricity has been central to South Africa's industrial expansion strategies throughout its history and was written into the 1928 law that established Eskom as a state-owned power utility. Cheap electricity relies on the abundance of coal in South Africa, cheap labour, extensive externalities and huge additional historical and current subsidies. Industry uses the largest part of South Africa's available energy, as shown in Table 3. Consistent with the concentration of economic power, the top thirty-six members of the energy-intensive users group consume 40% of electricity. All but six of the group are in mining and mineral processing or fuels and chemicals.

Within the industrial sector, the iron and steel and petrochemicals plants are the biggest energy users. Over 45% of the energy used in steelmaking comes directly from coal and coke, with a further 23% coming from electricity. ArcelorMittal's four South African plants consumed about 169 PJ and the Vanderbijlpark plant alone consumed a massive 76 PJ in 2005. Other metal smelters are also very intensive users. Aluminium is notable for the high proportion of electricity in the energy mix. Bauxite is not mined in southern Africa and BHP Billiton's three smelters were located in the region specifically for the low-priced electricity. In 2006, they consumed a total of 98 PJ of energy includ-

2 The ***Digest*** is meant to give timely and accurate information on energy. Timely it is not. So the numbers in the tables are dated, but they do give a sense of the scale of overall energy production and use and the share of different forms of energy.

3 A joule is a basic measure of energy. A petajoule is 1 000 000 000 000 000 joules and 3.6 PJ is equivalent to one TeraWatt hour (TWh), or 1 000 000 000 kilowatt hours (kWh), of electric energy.

Table 2: Final energy demand by sector in 2006

	Total energy		Electricity	
	Petajoules	%	Petajoules	%
Total	**2 705**	**100.0**	**768**	**100.0**
Industry	871	32.2	420	54.6
Mining	202	7.5		
Transport	725	26.8	13	1.7
Residential	525	19.4	142	18.4
Agriculture	70	2.6	21	2.7
Commerce	211	7.8	104	13.5
Other	81	2.9	68	8.8
Non-energy*	20	0.7		

Compiled from DoE 2009. (Figures rounded)

* "Non-energy" includes chemicals, plastics and paper made from coal, oil, gas or wood.

Electricity consumption figures exclude energy producers. Including the oil refineries, but not Eskom's own use, adds 29 PJ and increases industry's share to 56.2% in 2006.

ing 74 PJ of electric energy or about 10% of Eskom's total production.[4]

Sasol's coal-based processes are largely responsible for the extraordinary intensity of energy use in the petrochemicals sector. In 2006, over 80% of the energy used to make liquid fuels and chemicals was directly supplied by coal and Sasol used 336 PJ of energy overall. The crude-oil refineries are also intensive energy users by any measure other than comparison with Sasol.

Despite successive price hikes, the cost of electricity to energy-intensive industries is still amongst the lowest in the world. The cost to households is relatively high. Access to domestic energy and electricity is highly unequal. Table 2 shows that households used 18% of all electricity, but most of this was used by the richest 20% of households. A large proportion of the population is "energy-poor": 20% do not have access to electricity and many who do use very little because they can afford electricity only for lights, TV and radio. For many people, access to electricity is intermittent. Millions of South Africans are regularly cut off because they cannot pay the bill and, with the introduction of prepaid meters, uncounted numbers are cut off every month when they run out of money to feed the meters.[5] People use paraffin, coal, wood and even rubbish as alternatives and this leads to high levels of local and indoor air pollution, particularly in winter.

4 Two plants are at Richards Bay. The Mozal plant outside Maputo is not included in the South African statistics but is supplied by Eskom. It consumes more power than the rest of Mozambique.

5 See Dugard, 2010 and The groundWork Report 2013.

Table 3: Annual air emissions from key energy producers and users (tonnes)

Pollutant	Eskom (to March 2012)	Sasol global (to June 2012)	ArcelorMittal (to Dec 2011)
Carbon dioxide	231,900,000	66,843,000	15,440,000
Sulphur dioxide	1,849,000	202,000	24,842
Nitrogen oxide	977,000	155,000	-
Particulates	69,683	7,470	4,729
VOCs	-	463,000*	-

Based on industry Annual and Sustainability Reports. Blank cells do not necessarily mean that the pollutant is not emitted, merely that it is not reported.

* Includes methane

Emissions

South Africa emitted about 450 million tonnes (mt) of carbon dioxide (CO_2) in 2009. That was the year of the recession and emissions were down from 479 mt in 2008. This makes it the biggest source of emissions in Africa and it is ranked twelfth in the world.[6] This compares with its global economic ranking in twenty-ninth place.

The big energy producers and users are all big polluters. In absolute terms, Eskom stands out even in the company of South Africa's other world-class polluters and accounts for around 45% of South Africa's CO_2 emissions. It has bag filters to catch particulates on some plants, but has otherwise resisted installing pollution controls for emissions that affect local environments and people's health. The results show in Table 3. Sasol's coal-based processes are largely responsible for the extraordinary intensity of energy use in the petrochemicals sector. Sasol's Secunda plant is the biggest single point source of CO_2 in the world and, for each unit of energy produced, Sasol pollutes more than Eskom. ArcelorMittal is the largest iron and steel maker and emissions are indicative of the scale of pollution from the minerals sector. ArcelorMittal's emissions are matched by BHP Billiton's aluminium smelters but that corporation's Sustainability Reports have not given a breakdown of emission figures for these plants since 2006.

Reporting on pollution from the coastal crude oil refineries – Sapref and Engen in Durban and Caltex in Cape Town – has also dried up. Caltex has not given a public account of its emissions for over a decade, while the latest data on Sapref and Engen's websites is from 2009. And, while Sasol's global reporting is up to date, it has not given information on local emissions since 2004. Despite trumpeting the virtues of "triple bottom line

6 In 2011, the Department of Environmental Affairs said emissions of all greenhouse gases had reached 540 million tonnes CO_2-equivalent a year. This is a lot higher than the target reduction against business-as-usual proclaimed by President Jacob Zuma ahead of the 2009 Copenhagen climate summit. The DEA therefore manipulated the figures to allow an extra 110 million tonnes a year. See groundWork's Position Paper on Climate and Energy Justice (2011) to see how they did it (pages 22 ff).

reporting", corporations appear to be intent on obscuring information on local emissions.

> In absolute terms, Eskom stands out even in the company of South Africa's other world-class polluters and accounts for around 45% of South Africa's CO_2 emissions.

On the coal mines of South Africa, fires started by "spontaneous combustion" are thought to burn as much coal as Eskom does. Underground fires at what are called "ownerless and abandoned" mines have burnt for fifty years or more. These emissions are not mitigated in any way and nor are they counted. Dust is also blown from the mine dumps and is loaded with heavy metal toxins. Gold is associated with uranium and dust from the dumps along the main reef is laced with radioactive particles.

Emissions from the numerous incidents – explosions, fires, flares and leaks – at major plants are similarly unmitigated. Despite a series of serious incidents at the refineries in south Durban, the authorities have avoided developing an emergency plan for the area.

Air pollution is matched by ground and water pollution. South Africa's minerals and energy corporations produce mountains of solid waste and rivers of liquid waste, much of it toxic. In addition to the pollution of water used in production, mining turns groundwater into toxic "acid mine drainage" (AMD). The large-scale destruction and contamination of aquifers, wetlands and rivers now presents the prospect of an environmental catastrophe which will, for South Africa, be of the same order as catastrophic climate change.

Expanding fossil fuels

In the 1980s, Eskom embarked on a large round of building new plants justified by projections of rapidly growing demand. The demand did not materialize, and the utility had to mothball several plants. In 1998, the White Paper on energy policy predicted that Eskom's surplus generating capacity would run out in 2007. This policy reaffirmed the commitment to cheap and abundant power for industry, but also said that Eskom should be broken up and privatised. Private corporations, however, had no interest in buying into the electricity sector without a steep increase in the price.

In 2004, government expressed disappointment that its market-oriented policies had not produced the desired levels of economic growth and jobs. It then proclaimed that the "developmental state"' would take a more central role in driving growth and put the privatisation agenda on hold. Instead, it saw Eskom and other state-owned corporations channelling large scale investment to stimulate growth.

In 2005, government announced the "new build" programme to refurbish three mothballed coal plants and build two very large new ones – Medupi and Kusile. At the same time, it hawked cheap power to international investors. Rio Tinto signed up to build a large aluminium smelter in the Coega Industrial Development Zone (IDZ), while major expansions were either planned or in progress in the platinum mines, at the Hillside and Mozal aluminium smelters and various ferrochrome smelters, at Columbus Steel and ArcelorMittal and at Sasol. In January 2008, the power tripped out and, eight months later, US investment bank Lehman's

collapsed. The boom was over, South Africa went into recession and numerous projects, starting with Rio Tinto's smelter, were cancelled or delayed.

The economic crisis saved Eskom's spinning margin – the surplus of generating capacity over peak demand – but ruined its prospects of obtaining the capital for the new build. The World Bank then came to the rescue with a US$3.75 billion loan, supplemented by a similar amount from the African Development Bank. The Bank said its loan would bring financial stability to Eskom, support future economic growth, contribute to poverty alleviation, and help South Africa onto a "low-carbon path". There is, of course, no poverty alleviation in it and the path is distinctly high-carbon since the new build adds upwards of 90 mt CO_2 a year. What is really at stake for the World Bank is that South Africa should continue to supply the world market with energy-intensive mineral resources.

South Africa's established coal fields in the Vaal Triangle and Mpumalanga Highveld are now being depleted. There is still a lot of coal there and new mines are being opened to supply Kusile, the three "return-to-service" mothballed plants, and an expanding export market for coal. But virtually all of Eskom's supply must be replaced. At present, Eskom burns 125 mt of coal a year – half South Africa's total production – and says it will burn four billion tonnes between now and 2050. Ian Hall, of AngloCoal and chair of the South African Coal Roadmap, says that 120 mt/y of new mining capacity must be developed in the next six years just to supply Eskom. This

coal will be of poorer quality, further from the power stations and more expensive.[7]

The new coal frontier is in the Waterberg, which is said to hold 50% of remaining reserves. Medupi is the first of a number of projects planned or mooted for the area. They include further power plants – whether built by Eskom or private power producers – and the associated mines and coal export ventures. Sasol has also worked on feasibility studies for an entirely new coal-to-liquid plant, although this project has been put on ice. Irrespective of whether that project will be taken forward or not, the Waterberg is already designated as the next air quality priority area in anticipation of Medupi's completion.

In the meantime, Sasol has expanded production by about 20% at its Secunda plants and is opening new mines to replace 60% of existing coal capacity in the next eight years. It is also increasing its gas supply from Mozambique to supplement the declining coal stocks.

Oil is South Africa's largest import item and paying for it compels the export of coal and minerals. The infrastructure has been expanded with two new pipelines, Transnet's high capacity multi-fuel pipeline connecting the Durban refineries with Gauteng and a privately owned pipeline carrying refined product imported through Maputo. PetroSA is meanwhile pushing to build a new and very large refinery at the Coega IDZ outside Port Elizabeth. The corporation is in search of a partner to fund the project and

7 Martin Creamer, ***Serious lack of coal supply for Eskom – Roadmap***, Mining Weekly, February 1, 2013.

has agreed with Chinese giant Sinopec to do a joint study of the "business case" for the refinery. PetroSA says the refinery will turn dirty crude oil into clean fuels so pollutants such as sulphur must end up in the air, water or waste dumps.

PetroSA also produces crude oil and gas offshore from Mossel Bay. These small fields are in decline but exploration is intensifying all around the coast. This is driven by a global decline in production of conventional "easy" oil and optimism created by new discoveries off the west and east coasts of Africa. Exploration is furthest advanced off the west coast where PetroSA, Sasol, BHP Billiton and Shell are major players. On the east coast, ExxonMobil has entered the field through an agreement with Impact Africa, a small exploration company which owned the licences. Silver Wave, a company reportedly linked with Burma's ruling junta, has been awarded exploration rights over much of the rest of the east coast area.

On-shore exploration is focused on non-conventional gas from the Karoo shale formations which underlie much of the country. Shell is the leading proponent with the best prospects in the Karoo itself. Other major players include Anglo American, Falcon, Bundu and Sungu Sungu. Sasol has withdrawn from a consortium with Chesapeake and Statoil, possibly because it believes it has better prospects with conventional gas in Mozambique.

Shale gas is produced by "hydraulic fracturing" or "fracking", a technology deployed in the US when conventional gas sources started drying up after 2002. It involves injecting a combination of water, sand and toxic chemicals into the well at high pressure to force the gas from the shale. It is costly and energy-intensive and constant drilling is needed to maintain production because the wells are quickly depleted. Key concerns relate to the use and abuse of water, including the toxic contamination of aquifers.

Gas is the cleanest burning of the fossil fuels and Sasol has made much of its virtues. However, leaks of gas to air are common all along the gas production line and fracking appears to be particularly prone to leaks. Gas is around 70% to 80% methane, with the balance being CO_2. Since methane is a potent greenhouse gas – one tonne of methane is equivalent to about thirty-four tonnes of CO_2[8] – the climate benefits are cancelled by large-scale leaking.

8 One tonne of methane was previously estimated to be equivalent to twenty-five tonnes of CO_2 over a hundred years. The Fifth Assessment Report (AR5) of the International Panel on Climate Change (IPCC) has revised this to thirty-four, which is a nearly 40% increase in the estimated strength of methane as a heat trapping gas.

2. History of air quality in South Africa

Bobby Peek

Apartheid produced the building blocks for environmental racism in South Africa, but it was not only in 1948, with the coming to power of the National Party government, that apartheid was born. The segregated city was established way before, during British colonial rule. Indeed, the British established the template for environmental racism which was later used by the apartheid state.

Durban has a reputation for being the first city in South Africa to establish apartheid principles to govern industrial expansion. Dirty industry and the toxic pollution that came from it was officially placed in areas where black people lived. The blueprint for a black neighbourhood was a waste dumpsite, where waste from rich white neighbourhoods and dirty industry was dumped, a sewage plant, and dirty industry that provided toxic jobs for an expendable black workforce. Thus it is no surprise that, come 1994, resistance to environmental racism started emerging in these very communities. Yet toxic air pollution knows no boundaries and resistance to this environmental injustice also came from privileged white people who periodically found themselves downwind of polluting plants.

With colonial Britain dominating South Africa's development, it is no surprise then that the air we breathe was governed by a piece of legislation, the Air Pollution Prevention Act No. 45 (APPA) of 1965, based upon

The blueprint for a black neighbourhood was a waste dumpsite, where waste from rich white neighbourhoods and dirty industry was dumped, a sewage plant, and dirty industry that provided toxic jobs for an expendable black workforce.

the British Alkali Act of the late 1800s.[9] The APPA regime was entirely undemocratic and was used as a licence to pollute. It required operating permits for large industries, which were issued under the authority of the Chief Air Pollution Control Officer (CAPCO). By the late 1980s, there were just seven officers working under this authority. In reality, the permits were written by industry and were secret. They regulated very few species of emission. Thus, cement kilns that burnt toxic waste were regulated only for dust, oil refineries were regulated only for basic sulphurs and nitrogen oxides and volatile organic compounds were conspicuously absent from all permits. The permits were, in any case, little more than formalities and penalties for contravention were unheard of. Security legislation, notably the Key Points Act introduced in the 1980s, placed major industries beyond scrutiny, even by local authorities nominally responsible for some forms of pollution.

This chapter presents a brief summary of the struggle for clean air in South Africa and how this struggle found a rich breeding ground in post-apartheid South Africa to bring people who were separated together

9 See http://airqualitylekgotla.co.za/Downloads/Publications/The%20National%20Environmental%20Management%20-%20Air%20Quality%20Act,%20(Act%20No%2039%20of%202....pdf.

for a unified struggle to bring "common resources to bear on common problems".[10]

Apartheid, petroleum, power and pollution

In 1948, the National Party government started writing apartheid into law and it initially fitted well with the international order created by the United States following World War II. It was nevertheless concerned that it would become the victim of a global shortage of oil, and established Sasol to extract liquid fuel from coal using the Fischer-Tropsch technology developed by Nazi Germany. This extremely polluting industry was located on the coal fields of the northern Orange Free State, in the purpose-built company town of Sasolburg.

By the time it produced its first fuel in 1955, the post-war oil shortage had turned to glut and Sasol survived on subsidies through to the 1970s when the oil shocks multiplied the price of crude. By then, the anti-apartheid campaign was gathering force and South Africa was increasingly seen as a pariah state. Fearing systematic isolation, the apartheid state fast-tracked the expansion of the coal-to-liquids industry with two more Sasol plants at Secunda on the Mpumalanga Highveld.

By the 1970s, there were four crude oil refineries in the country. Mobil's Stanvac refinery (now Engen) was built in 1954 on

Shell-BP refinery in south Durban

10 As Deva Govinsamy, a founding member of the South Durban Community Environmental Alliance, put it at SDCEA's establishment in 1995.

land taken from market gardeners in south Durban. In the 1960s, Shell and BP entered a joint venture to build Sapref (South African Petroleum Refinery) just a kilometre away from Mobil, Caltex built its refinery at Milnerton in Cape Town and, inland, Sasol teamed up with the French oil company Total to build Natref (National Petroleum Refiners) in Sasolburg. Natref gets crude oil from a pipeline linking it to south Durban. The oil tankers are too big to enter the port and 80% of South Africa's crude oil – supplying Sapref, Engen and Natref – is imported via the "single buoy mooring" just offshore of south Durban.

The minerals-energy complex defined the trajectory of air pollution in South Africa for a century.

Eskom, the state power utility, was established in 1928 to supply "cheap and abundant" coal-fired power to energy-intensive industries. For two decades it struggled for a foothold in the market but, following the war, it established a monopoly position and grew rapidly. It was an integral part of the minerals-energy complex. The big mining houses, led by Anglo American, both supplied the coal for Eskom's plants and were the biggest consumers of power. Cheap power came at the price of mineworker's lives, the environment and the health of the people. The minerals-energy complex thus defined the trajectory of air pollution in South Africa for a century.

The development of the oil refineries did not go down without resistance. In both Durban and Cape Town, the newspaper archives contain thick files that bear testimony to this. In Cape Town, the archive documents how local resistance forced the Caltex Oil Refinery to abandon its original plan to build in Athlone and to move the refinery site to Milnerton, in the northern suburbs. In Durban, opposition to the construction of Mobil's refinery from people on the Bluff, an historically white neighbourhood, is well documented. While some people of colour lost land when it was built, very little resistance came from Wentworth and Merebank. These townships were established at some distance from the Bluff to house pools of cheap labour for the development of industry in south Durban, including the construction of the refineries. Once the oil refineries were built, the workers – mainly men – were no longer needed full time in south Durban. They were then drawn into a migratory pattern of labour, supplying artisan skills (pipefitting, welding, and so on) for the construction of large, new industrial projects, including Sasol and Caltex, while their home base in south Durban was dumped on by the oil refineries.

Democracy – pollution unifying struggle

With the dawn of democracy came the possibility of a new South Africa that could

unify people in a common cause. Resistance to air pollution from the oil refinery sector in south Durban was evident not only from the Bluff, which was a white area, but also in Merebank which was demarcated for people of Indian origin. Living between Engen and Sapref, they were vocal about this environmental racism decades before 1994, but their protests fell on the deaf ears of the apartheid regime. In the early 1990s, as South Africa anticipated the end of apartheid, people from the Bluff and Merebank started working together to find ways of challenging air pollution. But it was not until the 25th of March 1995, when Mandela arrived to open an expansion project at Engen and was met by people from the Bluff and Wentworth protesting outside Engen, that the potential to unify the struggle was realised.

That evening, after he had finished the official business at Engen, Mandela called for a meeting with the local leadership in south Durban. They went separately to the meeting, people from Wentworth and the Bluff represented by one group of leaders and people from Merebank represented by another. Three days later, the joint leadership was asked to meet with Mandela and his ministers and this meeting created a strong motivation to start working together on pollution issues in south Durban. This led to the creation of the South Durban Community

It was not until the 25th of March 1995, when Mandela arrived to open an expansion project at Engen and was met by people from the Bluff and Wentworth protesting outside Engen, that the potential to unify the struggle was realised.

Environmental Alliance (SDCEA) by local organizations from all south Durban communities.

Engen resistance

When Engen was planning for Mandela's visit in 1995, they started reaching out to the community people of south Durban to set up a Community Awareness and Emergency Response (CAER) programme, the chemical industry's community-level propaganda vehicle established in response to the Bhopal disaster in 1985. While the community engaged within the process cautiously, they were unaware of the real reason behind Engen's approach, which was to smooth the way for Mandela's visit and to indicate to him that Engen was "talking" to the community. When the community became aware of this in February 1995, they felt duped and immediately went on the offensive, demanding real reductions in pollution rather than just a forum for talking about reductions in pollution. With support from US-based community activists and a lawyer in Durban, the community presented Engen with a formal request to reduce their pollution. Needless to say, Engen scoffed at the idea and thus provoked the protest on the 25th of March.

By March 1998, after many years of struggle, Engen recognised it could not "divide and rule" and agreed to reduce sulphur dioxide emissions by 80% in the next five years. A victory for unity.

Despite Mandela's intervention, Engen did not take action. Nearly a year later, in February 1996, Engen said that when they promised Mandela that they had resources to deal with their pollution problem, they had not meant money. In the process till then, the south Durban communities relied on assistance from the Legal Resource Centre (LRC) and technical people from Cape Town and abroad. When it became clear that Engen was not prepared to budge on the issue, the community went back to protesting and public campaigning against Engen. By March 1998, after many years of struggle, Engen recognised it could not "divide and rule" and agreed to reduce sulphur dioxide emissions by 80% in the next five years. A victory for unity.

Caltex resistance

While people were taking action against Engen in south Durban, a similar struggle was being waged against Caltex in Milnerton, Cape Town. For many years, as with Engen, people's voices were not heard. But the transition from apartheid brought new people into local government and a much more sympathetic ear to community concerns. Caltex then tried to appease the community with promises, made in August 1994, to reduce its pollution. In 1995, however, this came to nought. The community felt that national government did very little to make Caltex stick to its promises and they then lodged a formal complaint with the South African Human Rights Commission. Community groups in the northern suburbs of Cape Town, while not in contact with the south Durban people, realised that a similar strategy was necessary – local community groups had to speak with one voice on these issues.

The Bucket Brigade

At then end of the 1990s, groundWork was formed and worked closely with the commu-

nity groups in south Durban and in Milnerton. In April 2000, after hearing of Sasol's plans to increase production at Natref in Sasolburg, groundWork, together with the Group for Environmental Monitoring (GEM) and the LRC, visited Sasolburg to find out more about what people knew about the proposed expansion. What they learnt from the people was that Natref claimed its increased capacity would not result in local ambient air pollution standards being exceeded. Since there were no enforceable standards, this was not a valid statement. Moreover, the air in Sasolburg was already saturated with pollution and more was not welcomed.

In May 2000, groundWork, together with the Communities for Better Environment (CBE) and the South African Exchange Programme on Environmental Justice (SAEPEJ) based out of the US, visited various pollution hotspots around South Africa, including south Durban, Sasolburg and Cape Town. They took air pollution samples in local neighbourhoods using a low-tech system developed by CBE to enable community people to take a "bucket" sample of air. The samples were sent to accredited laboratories in the US and, when the analysis came back, it highlighted significant levels of volatile organic compounds – particularly benzene – and high and problematic levels of sulphurs. This was not a surprise as this was air from the fenceline of negligent crude oil refineries. Sasol tried to refute the findings but could no longer present its own analysis and expect to be believed. It commissioned the South African Regional Science Initiative and Leeds University to conduct a sampling programme. The results confirmed the bucket findings and hence also enhanced the credibility of the method.

The media followed the story voraciously because, for the first time in South Africa, air pollution samples that exposed toxic

emissions from the petro-chemical industry were now in the public domain. Following up on the finding of high benzene levels in south Durban, a local journalist did in-depth research which indicated that the people in south Durban had a leukaemia rate "24 times higher than in other parts of the country".[11] These stories ran over five days in the local media against a backdrop of gas leaks, explosions and fires at industries around the country. groundWork and SDCEA organized mass protests in Durban and were joined by large numbers of school children who had been gassed out in successive incidents.

By this time, the moribund APPA regime had collapsed. There were just four air pollution control officers left and it appeared that government had abandoned control of polluting industries. In December 2000, government hastily organized a south Durban "stakeholder" meeting with a group of national and provincial ministers and the local mayor. They put together a "Multi Point Plan" (MPP) which promised new air quality legislation and national standards, credible air pollution monitoring and enforcement, and an assessment of community health impacts. The eThekwini MPP was also to be the pilot for action in other pollution hotspots – subsequently termed "air pollution priority areas". This is elaborated on in Chapter 5.

Ducking standards – fighting for meaningful law

In the second term of democratic government, South Africa still did not have legislation on air quality that could hold polluting corporations accountable and Valli Moosa, as the Minister of Environment and Tourism, did not deliver credible legislation on air pollution. This five year period, from 1999 to 2004, was the most active and contested period in the history of people's resistance to corporate air pollution and demands for accountability. The vocal nature of the struggle got the national parliament's Portfolio Committee on Environment and Tourism to adopt the language of "toxic hotspots" which was coined by community groups in their struggle.

Rather than relying on the "fox to guard the hen house", civil society demanded air quality legislation that could be used to hold polluting corporations accountable.

Following the bucket brigade saga, Sapref was challenged on its emissions reporting and forced to admit to under-reporting air pollution. Industry was on the back foot and sought to take back the initiative by pushing for the use of environmental management cooperation agreements (EMCAs), under the National Environmental Management Act (NEMA) Section 35, to manage air pollution. EMCAs provided for a self-monitoring, voluntary system relying on the probity of corporate polluters. Community groups and groundWork vigorously opposed them. They drew on technical support from environmental groups in the Netherlands, which highlighted the failure of cooperation agreements there. Rather than relying on the "fox to guard the hen house", they demanded air quality legislation that could be used to hold polluting corporations accountable.

11 http://www.iol.co.za/news/south-africa/durban-cancer-cluster-not-a-fluke-expert-1.44623#.Ux-U3ofmSwXs.

By 2004, community people were "up in arms" in south Durban, Sasolburg and the Vaal area, Secunda, Richards Bay and Cape Town. They had gathered on numerous occasions, challenging government's slow pace in delivering meaningful air pollution legislation. Not only were people raising concerns throughout the country but, at this time, they still had meaningful links with parliament and raised concerns about air pollution and the constant stream of incidents at petrochemical plants. At Engen in Durban, Sasol in Secunda and Natref in Sasolburg, successive incidents resulted in the deaths of many workers, the most catastrophic being the death of ten workers at Sasol's coal-to-liquid plant in Secunda in 2004.

Government finally realised that it had to act on the promise made in Durban in 2000. It released the National Environmental Management: Air Quality Bill in February 2004, during the last sitting of the 1999-2004 government. Community people attended the hearings and refused to accept the Bill, which was then held over for the next government.

The Bill, which subsequently became NEMA: AQA, named health as the primary purpose of the Bill and included emissions standards, to complement ambient standards, and so provide a focus on reducing pollution at source.

They said, amongst other things, that the Bill did not include:

- ☞ a clear reference to health, linking the Bill to the environment right in the Constitution;
- ☞ mandatory national emission standards aimed at minimising air pollution from industrial sources;
- ☞ time frames to ensure that compliance is achieved with these and other standards in the Bill; and
- ☞ a requirement for clear information systems such as Toxic Release Inventories and Pollution Release and Transfer Registries.

Community groups also demanded that there should be no exemptions for polluting industries and that official discretion, where the Bill allowed it, should be guided by clear criteria that ensured the protection of constitutional rights. They were further concerned that the Bill devolved responsibility for air quality management to the local level where, for the most part, there was no capacity for it and there were no adequate mechanisms of support for the local sphere from national government and provinces (also poorly resourced).

The Bill was held back by the outgoing government and, in the interim, community groups organized "toxic tours" for incoming politicians. In August 2004, the Bill was reintroduced with significant improvements and subsequently signed into law as the National Environmental Management: Air Quality Act (AQA). It named health as the primary purpose of the Bill and included emissions standards to complement ambient standards, and so provide a focus on reducing pollution at source. However, it still allowed for exemptions – a bitter pill for fenceline groups and a loophole that the corporations are now driving through. Moreover, the devolution of responsibility for air

quality to local government has proved disastrous.

Dismantling gains made

Both government and industry are working at making sure the gains that were made ten years ago are reversed in the present era.

The first practical manifestation of this was the dismantling of the eThekwini pollution monitoring and enforcement capacity. In line with the eThekwini MPP, and with substantial support from the Norwegian government, eThekwini City Health developed an extensive air pollution management system which linked the licensing of industrial processes and technical monitoring capable of identifying pollution sources and so enabling enforcement. SDCEA and groundWork supported this process while contesting many details of implementation in order to strengthen it. In 2011, the system that took ten years and considerable cost to create was destroyed in a month, as described in Chapter 5. The monitoring systems in the priority areas of the Vaal and Highveld are not much more functional.

Civil society demands for emissions standards, as well as ambient standards, go back to the 1990s because they provide the means to hold polluting industries accountable. Their inclusion in the AQA was a victory for fenceline groups against concerted industry opposition. The battle continued through the technical process of setting actual standards, a process that stretched over the next seven years with full participation of polluting industries. Emissions standards were first promulgated in 2010 and further developed in 2013.

At the last multi-stakeholder gathering discussing these new standards, in May 2013, there was a notable absence at the negotiating table – Eskom. A few weeks later, in June 2013, Eskom told the DEA that it would apply for exemptions from, or the (everlasting) postponement of, compliance with emission standards for sixteen of their power plants, including all coal-fired plants except Kusile. In January 2014, they finalised their request and published the following documents for public comment: sixteen postponement applications, sixteen Atmospheric Impact Reports (AIRs), sixteen variation requests, thirteen fugitive emission management plans, fourteen general information documents and various other supporting documents – more than eighty documents in all. The comment period was limited to thirty-seven calendar days or twenty-seven working days. The application is discussed in more detail in Chapter 7.

Eskom's application for exemption from the law seems intended to finally torpedo emission standards and wreck the work that community people have undertaken over the last twenty years to be able to hold corporations accountable.

It is difficult to avoid the conclusion that Eskom planned this all along. Through seven years of negotiating emissions standards, it did nothing to adapt its plants to comply once the standards were implemented. It is now trying to use the law to break the law. This application seems intended to finally torpedo emission standards and wreck the work that community people have undertaken over the last twenty years to be able to hold corporations accountable. Lining up behind Eskom, the oil refineries and other

industries have said that they too will apply for postponements and/or exemptions. If the application succeeds, we are back to square one.

Past, present and future failings

The APPA failed society because it was anti-democratic and used as a licence to pollute. Even officials of the DEA admitted that there was a vacuum of governance and that industry operated in a state of lawlessness. The AQA, flawed as it is, was a step in the right direction but it is increasingly apparent that government does not intend to make it work while the corporations, led by Eskom, are actively wrecking it. A dysfunctional air quality system evidently serves the interests of the minerals-energy complex.

Local and provincial governments remain without capacity, capacity in the national department is allowed to decay and there is no visible effort to build capacity at any level. The corporates, such as Shell and BP, claim confidentiality for information on pollution and have refused access to their Atmospheric Emission Licences. They clearly intend to restore a regime of purposeful ignorance where information is not available or not produced in the first place. What is not measured cannot end in liability.

An effective pollution and toxic release inventory has still not been decided upon. Instead, the agenda seems to criminalise people who report on pollution – a first attempt at that was made with the South African Weather Services Bill where it nearly escaped notice before groundWork and its partners successfully objected to it. The Protection of State Information Bill and the recently revived National Key Points Act will further reinforce a regime of secrecy and impunity for both state and corporate capital.

Finally, government is considering policy to allow industries to "offset" emissions. A somewhat incoherent draft policy paper (DEA 2014) argues that, following the National Development Plan's priority for economic growth, industrial expansion in the air quality priority areas will increase emissions but this can be "offset" by reductions in emissions from domestic fuels, veld fires, traffic and dust blown off mine dumps. It even suggests that offset programmes may substitute for government paralysis in dealing with non-industrial emissions.

Most immediately, the policy responds to Eskom's proposal that its refusal to comply with minimum emission standards at all its existing power stations (see Chapter 7) can be offset by reducing domestic emissions in one suburb of Emalahleni. Local people point out that this does nothing for the rest of the Highveld, the Vaal or Lephalale. Moreover, addressing domestic emissions should not be anyone's offset, but is the responsibility of government. Government's paralysis is more a symptom of indifference than of the much-repeated idea of difficulties in inter-departmental coordination. Domestic emissions are now made an issue merely to get industry off the hook of minimum emission standards. So, must one be polluted to get public services? People believe that patchy offsets, where government's responsibilities are out sourced to dirty industry, will intensify the already widespread contestation on the ground around service delivery.

The real point of offsets is to allow government and corporates to cut whatever sort of deal they like. Further, we have been given to understand that the decision on Eskom's application to "postpone" compliance with emission standards will be handed down to the DEA from the ministries pushing government's infrastructure expansion. Offsets then appear as a public relations cloak for the political subordination of the DEA and the determination that the minerals-energy complex will expand, irrespective of environmental damage.

The future looks bleak.

3. A short history of Air Quality Priority Areas (including south Durban and Lephalale)

Siziwe Khanyile

groundWork works with local community organizations in South Africa's industrial pollution hotspots. These include south Durban, which is the largest oil refining centre, the Vaal Triangle and the Mpumalanga Highveld, in the traditional heart of South Africa's coal economy, and Lephalale in Limpopo, on the new coal frontier.

groundWork works with alliances of local organizations that bring people together to create a common voice to confront the environmental injustices perpetrated by big, polluting industries. There are a variety of smaller organizations in other areas such as Newcastle that are beginning to create a base for resistance.

South Durban

The South Durban Basin is a major industrial hub in KwaZulu-Natal. It stretches from the Port of Durban in the north to eZimkokodweni in the south and is home to two large petrochemical refineries, a large paper mill, motor manufacturers and at least 5 000 businesses, 22 000 households and 200 000 residents. It includes the residential areas of Clairwood, Bluff, Wentworth, Merebank, Isipingo, and Lamontville and the industrial areas of Jacobs and Prospecton.

In the 1930s, the pre-apartheid Durban City Council took control of the area to establish it as an industrial centre. Over the next few decades, seine netters, small farmers and local businesses were squeezed out to make way for industries. In the 1950s, through the enforcement of the apartheid Group Areas

Act, Coloured, Indian and African communities were relocated from other parts of Durban to create a labour pool next to the heavy industries. This history has resulted in a tense relationship between residents, big business and environmentalists.

South Durban Community Environmental Alliance

The South Durban Community Environmental Alliance (SDCEA) is an environmental justice organization formed in 1996 and made up of sixteen affiliate organizations. It has made a major contribution to the struggle against environmental injustice and racism and the promotion of environmental health. It is active in researching and reporting industrial pollution, including industrial incidents and accidents, in environmental education, and in mobilising people to defend their environment and livelihoods.

The formation of SDCEA was its first success as it cut across the divisions of race and creed imposed by apartheid and brought people together on an issue of common concern. Membership includes local residents' associations, environmental, health and faith-based organizations and occupational associations. The founding members realised that, alongside unity, the quality of information was critical to the strength of the organization. They also identified the crucial role of the media in environmental struggles and SDCEA has increased its media effectiveness over the years. The core of SDCEA's strength remains its ability to create knowledge and mobilise people around a common environmental justice agenda.

SDCEA has led the fight for better air quality in south Durban and has won a significant reduction in emissions. It was instrumental in bringing government to commission a major study on the effects of air pollution on the health of local people. Through its participation in national alliances, it helped force government to rewrite policy and law on air pollution.

The priority areas are intended to focus air quality management resources (human, technical and financial) where they are most needed.

Vaal Triangle

Toxic solid waste dumps are seen throughout the Vaal Triangle and at the foot of each hill of waste is the industrial plant that made it: Eskom's Lethabo Power Station just south of Vereeniging, ArcelorMittal's Vanderbijlpark steel works (formerly Iscor) and Sasol's coal-based chemicals industries. The area is a major centre of the minerals-energy complex, founded on cheap coal and energy-intensive mining and industry that dominates South Africa's economy. The Vaal Triangle was the first air quality priority area declared in terms of the Air Quality Act of 2004. The priority areas are intended to focus air quality management resources (human, technical and financial) where they are most needed.

Vaal Environmental Justice Alliance

The Vaal Environmental Justice Alliance (VEJA) was formed at a meeting of community-based organizations and groups fighting for environmental justice on different fronts of development. The meeting included religious, environmental, youth and women's organizations and trade unions. Taking inspiration from SDCEA, VEJA is inclusive.

Some organizations bring large constituencies while others are small activist groups.

The immediate spur to VEJA's formation was the catastrophic poisoning of groundwater in Steel Valley just downstream of the Vanderbijlpark steel works. The Steel Valley Crisis Committee was formed in response to this tragedy and the Friends of Steel Valley was formed by outside groups to show solidarity in the struggle. The resolution to establish VEJA was taken at a workshop organized by the Friends of Steel Valley.

The Vaal Working Class Crisis Committee was formed in response to mass retrenchments from Iscor in 1998 and challenged the corporation on unfair labour practices connected to outsourcing and corruption and unfair evictions from houses and hostels. The Samancor Retrenched Workers Crisis Committee represents workers unfairly retrenched and not compensated for damage to their health.

The Sasolburg Air Quality Monitoring Committee takes air samples and records incidences to monitor the impact of air pollution. The Free State Procession of Youth works on the environmental, social and economic issues. Botle Batlhoho organizes environmental campaigns for learners focusing on climate change and monitoring the rehabilitation of the wetlands and monitoring sewer spills. Mollo Art is one of the strongest emerging movements in the Vaal, using art to bring social change and environmental awareness. The Evaton West Crisis Committee focuses on service delivery issues such as access to water, housing and electricity.

Faith-based organizations include the Christian Knowledge Independent Churches Forum of South Africa, which has brought thousands onto the streets in protests against poor service delivery, and Catholic Justice and Peace groups, which draw on a long history of committed social engagement. Trade

Blog post by Caroline Ntaopane of VEJA

In winter in the Vaal, local air quality is likely to be affected by stable climatic conditions that hamper pollution dispersion and dry conditions that promote dust formation. Dust from agricultural lands is likely to be worst from August to November when farmers till the soil prior to planting. The area certainly needs some kind of specific action in order to ameliorate the problem.

The Vaal Triangle has been identified as one of the national air pollution hot spots according to the National Environment Management Air Quality Act 2004 (Act No. 39 of 2004) (AQA). In effect, the area is called the "Vaal Triangle Air Shed Priority Area". In response, the National Department of Environmental Affairs (DEA) is now implementing a variety of different interventions for the improvement of the air quality within the area of Vaal Triangle. Some of the interventions involve the creation of a Priority Area Air Quality Management Plan (AQMP). The plan's development relates to the provisions as specified by the AQA.

A priority area is an area believed to already have poor air quality, or that is home to a situation that could potentially cause problems in the future. It is also believed that the area needs some kind of specific action in order to ameliorate the problem.

The Vaal Triangle has been selected as an area of priority because the air quality is considered extremely poor. In essence, people living within the area cannot continue to breathe air that has harmful effects on their well-being and health. People suffer from a high incidence of respiratory problems. Some of the problems include wheezing and asthma, as well as early morning coughing. Studies have identified the need for the Vaal Air Shed Area to start establishing a relationship between our poor air quality management and the health of the individuals who live within the area.

Ultimately, the Air Quality Management Implementation Plan was developed as a monitoring tool for the improvement of the air quality. In addition to that, a multi-stakeholder forum, consisting of community-based organizations, government and business, was established to make sure that the process is effective and achievable.

Most importantly, the plan aims at the reduction of the number of human and environmental health risks, while reducing the amount of emissions in a cost effective manner. In addition, it aims to empower the local municipalities, along with other national and government agencies, to help them to meet the outlined objectives of the Air Quality Act.

We as Vaal Environmental Justice Alliance are calling for government and industries to be transparent, to communicate with us and to inform us of any decision-making processes. We are very concerned about the lack of progress we see in achieving clean air. It is very prudent to have minimum standards and to respect them. What was the reason for putting standards in place, if companies fails to comply?

In the priority area, the community has not seen any positive change in terms of emission reduction and now companies want to ignore their commitment to reduce emissions. Companies comes up with tricks, and show no consideration for health impacts on communities.

In the Vaal Triangle, we thought that the declaration was an acknowledgement that there is a problem and that government would respect the decisions that are being made, and would hold those who are not complying to account. But we see government officials who do not have experience and who are very hesitant to deal with this companies. The process of reviewing the progress since 2006 took place, but without considering things such as capacity building, human resources and other things that are hindering the progress. The Implementation Task Teams in other areas are failing to work, particularly in Zamdela where we feel that the local air quality officers are being intimated by the companies. The ITT in Sasolburg has been struggling to meet and now we are sitting with unresolved issues.

We feel strongly that the Department is wasting money and that it doesn't want to look at the bigger picture. Most companies enjoying making profit without having to account to anyone. We say the same things over and over in the meetings and our voices are not being heard. We cannot have a situation where the Weather Service comes to this meeting with the monitoring stations report that shows that in the Vaal there is no progress, and we turn a blind eye on that and move on and accept that the Vaal is polluted, but maybe most of the pollution is coming from Johannesburg, as it has been said.

We are tired of listening to industries telling us how much they have spent on various technologies while the reduction is not visible in the air.

We need government to take more action against these companies and to do proper research to check who is polluting and how much are they polluting.

unions have shown a more cautious interest. The National Union of Metalworkers of South Africa formally participated in VEJA while Solidarity has participated in some meetings.

VEJA itself is politically non-partisan but engages with other role players including local, provincial and national government, industry and commerce in order to promote a healthy, safe and sustainable environment.

Highveld

Most of South Africa's coal has come from the Central Basin on the Mpumalanga Highveld. Coal is mined from open-cast and underground pits and eleven out of thirteen of Eskom's coal-fired power stations are located here. The new, very large, Kusile power station is also being built on the Highveld. Cheap and plentiful coal and electricity have attracted heavy industry, including Sasol's coal-to-liquid and chemical plants at Secunda and minerals smelters and steel mills at Witbank and Middleburg. The area is noted for heavy air pollution from industrial and other sources.

In November 2007, the Highveld was made the second air quality priority area. The Highveld Priority Area (HPA) covers 31 106 km^2, including the Ekurhuleni Metropolitan Municipality in Gauteng and three district municipalities (including nine local municipalities) in Mpumalanga.

Greater Middelburg Residents Association

Greater Middelburg Residents Association (GMRA) was formed in 2004 to educate people about their rights and help defend them. The organization mobilises people to fight for the delivery of municipal services and runs educational workshops on issues of public interest like the national, provincial

and local budgets. The overall objective is to encourage meaningful community participation in governance.

The GMRA collaborates with other CSOs on climate and environmental justice. It plays a leading role in mobilising communities across the Highveld to strengthen the fight for environmental justice. Highveld organizations include Ekurhuleni Environmental Organization (EEO), Mpumalanga Youth Against Climate Change (MYACC), Highveld Environmental Network (HEN), South African National Civics Organization (SANCO), Wonderfontein Resettlement Forum (WRF), Ogies Community, People's Empowerment, Outrageous Courage Youth (OCY), Schoongesigcht Residents Committee (SRC), South African Green Revolutionary Council (SAGRC), Middelburg Environmental Justice Network (MEJN), Guqa Environmental Community Service (GECS), and Greater Delmas Residents Organization. Together they use community monitoring tools to develop information on industrial and mining pollution as well as local and indoor air pollution from domestic sources. They seek to influence policy and act as watchdogs to promote compliance.

The Waterberg

The Highveld coal fields are now in decline and the Waterberg in Limpopo is being opened as the new coal frontier. Lephalale (previously known as Ellisras) is the main coal mining town. It lies on the Mokolo River, a tributary of the Limpopo River, just over sixty kilometres from the Botswana border.

Exxaro's Grootegeluk Coal Mine supplies Eskom's existing Matimba power station. The new Medupi power station is being built alongside Matimba, and Grootgeluk will double its output to meet the new demand. In October 2010, the Waterberg area was declared an air quality priority area in anticipation of the additional pollution from Medupi. The area includes the Bojanala Platinum District Municipality in North West as well as the Waterberg District Municipality in Limpopo.

Nthole Morwalo Community Organization

Nthole Morwalo was formed as a Non-Profit Organization (NPO) in 2010 to develop environmental protection and understanding and heritage practices. It was established because ancestral graves were exhumed without proper consultation with families due to development around the area. Founding members identified the need for an organization that, through collective action, would work to protect and restore the health of our environment – water, air and land, and including cultural heritage. It works with other NPOs and with communities to identify environmental risks that affect the community and to look for ways to avoid them. Regarding air quality, Nthole Morwalo plans to use relevant measuring and monitoring techniques to identify pollution, its likely impact on people's health and possible solutions.

4. Review of failure of government to enforce the law

Robyn Hugo and Rico Euripidou

> Everyone has the right to an environment that is not harmful to their health or well-being.

Section 24 of South Africa's Constitution says that "everyone has the right to an environment that is not harmful to their health or well-being, and to have the environment protected ... through reasonable measures ... that: prevent pollution and ecological degradation; promote conservation; and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development".

The Constitution says that municipalities have executive authority for "air pollution", but national and provincial government must regulate municipalities to ensure they perform effectively.

The National Environmental Management: Air Quality Act of 2004 (AQA) aims to protect health and the environment. It must be read with the National Environmental Management Act of 1998 (NEMA – the framework legislation for the protection of the environment), particularly the NEMA's National Environmental Management Principles, which guide the implementation of all environmental legislation. The Principles include:

- the public trust doctrine – that the use of environmental resources must serve the public interest;
- the precautionary principle – which requires a risk-averse approach, considering the limited knowledge about the consequences of certain actions;
- the preventive principle – that negative impacts on the environment and environmental rights must be anticipated and prevented, or at least minimised and remedied;
- the polluter pays principle – that the polluter must pay to remedy pollution, degradation and consequent health effects, and to prevent or minimise further impacts; and
- that environmental justice must be pursued, so that adverse environmental impacts do not unfairly discriminate, especially against vulnerable and disadvantaged persons.

The Air Quality Act

AQA recognises that the quality of ambient air in many areas does not support a healthy environment or promote social and economic advancement and that the poor are worst affected by air pollution's health impacts, while the high social, economic and environmental cost is seldom borne by the polluter. It aims to give effect to section 24 of the Constitution by improving ambient air quality so as to secure an environment not harmful to people's health and well-being. It says this right must be progressively realized – this is contrary to the Constitutional right which has no such qualification.

Framework for Air Quality Management

A national Framework for Air Quality Management is required to achieve the AQA's objectives and all state organs must give effect to it when acting in terms of the AQA. The Framework must be revised every five years. This should have been done by September 2012 but a draft revision of the Framework was published for comment only on the 15th of February 2013, and the revised Framework was finally published on 29 November 2013.

The Framework must include national norms and standards and the mechanisms, systems and procedures for complying with them. Norms and standards are for ambient air quality, the control of emissions from source, air quality monitoring, air quality management planning and air quality information management. They are thus intended to reduce emissions, prevent significant concentrations of pollutants in the air, and promote effective air quality management, monitoring and reporting.

Municipalities must monitor ambient air quality and source emissions with oversight from the Department of Environmental Affairs (DEA) and provinces. Provinces must also monitor ambient air quality as well as municipal performance. The DEA, with input from provinces and municipalities, must establish and maintain national norms and standards. The Framework says that information management is critical to driving "continuous improvements in environmental quality" (s4.2.1). The DEA, however, has not set the required standards "for the col-

lection and management of data necessary to assess":

- compliance with the AQA and with ambient air quality and emission standards;
- the performance of state organs regarding air quality monitoring plans and priority area air quality monitoring plans;
- the impact of and compliance with air quality monitoring plans;
- compliance with the Republic's obligations in terms of international agreements; and
- access to information by the public.

Although both the AQA and the Framework make repeated references to the importance of the public having access to air quality-related documents, there is very little access to reliable, up-to-date information. Not even atmospheric emission licences (AELs) are publicly accessible. The South Africa Air Quality Information System (SAAQIS), of which the South African Weather Service (SAWS) is the custodian, was intended to ensure that: "accurate, current, complete and relevant air quality information is available to all stakeholders and the public"; and "that air quality management decisions, interventions, activities and actions are informed by accurate, current and complete information" (Framework s5.2.1). It was to be "a one-stop site for users to get an overview of what air and atmospheric quality information exists" (www.saaqis.org.za). But SAAQIS has failed to meet the targets set out in the Framework and the revised Framework simply extends the deadlines.

Ambient air quality standards

The AQA takes an objectives-based approach to air quality management. The objectives are set by means of various standards. Thus, the Minister must establish national standards for ambient air quality, including the permissible concentrations of identified substances which threaten health, well-being or the environment. These are health-based standards supposed to represent acceptable exposures to pollution. National standards for emissions from point, non-point or mobile sources must also be established for each substance. The Minister must prescribe how ambient air quality measurements and source emission measurements must be carried out and how the results must be reported and to whom.

National ambient air quality standards were established on the 24th of December 2009 for coarse particulates (PM_{10}), sulphur dioxide, nitrogen dioxide, ozone, benzene, lead and carbon monoxide and, on the 29th of June 2012, for fine particles ($PM_{2.5}$).[12] The need to comply with certain of these standards is delayed, in some cases for almost eighteen years. In its Strategic Plan for 2012 to 2017, however, the DEA indicates that there should be progressive reduction in atmospheric pollutants and full compliance with ambient air quality standards by 2020.

> The damaging health impacts of air pollution have a disproportionate impact on poor people and so breach the principle of environmental justice.

12 PM_{10} is a particle of up to 10 micrometres (or microns), or one thousandth of a millimetre, in diameter. Fine particulates are 2.5 micrometres. PM_{10} emissions are visible as smoke. $PM_{2.5}$ emissions are less visible but these fine particulates penetrate deeper into the lungs.

Most of the ambient standards exceed the World Health Organization's (WHO's) recommended limits but, even so, South Africa is failing to meet them. The effect is that South Africans are being exposed to air pollution at levels that have a harmful effect on health and well-being. Poor people are most exposed because they live close to industrial air pollution sources – like industry, power plants and mines – and also burn coal, paraffin and wood in their homes. The result is that the damaging health impacts of air pollution have a disproportionate impact on poor people and so breach the principle of environmental justice. Setting scientifically inadequate standards and then failing to meet them is also not in keeping with the public trust doctrine, the precautionary principle, or the preventive principle.

Enforcement

The AQA does not provide for direct implementation of emission standards. It does not, for example, criminalise anyone whose emissions result in ambient standards being exceeded. Enforcement of ambient air quality standards must therefore be linked with the use of other mechanisms, like AELs and priority areas.

It is an offence if a licence-holder fails to comply with AEL conditions – including by exceeding the maximum allowed amount, volume, emission rate or concentration of pollutants that may be discharged in the atmosphere. On conviction, a licence-holder is liable to a maximum fine of R5 million and/or to a maximum five-year period of imprisonment. For a subsequent conviction, the maximum penalties are doubled.

A registration certificate was required for various "scheduled processes" in terms of the APPA. AQA provides that an APPA registration certificate continues to be valid – despite the repeal of APPA by the AQA – for four years from the 1st of April 2010 (i.e. until the 31st of March 2014) if:

- ☞ the holder of a certificate lodges a renewal application with the licensing authority of the area in which the scheduled process is located within the first three years of the four-year period (that is, by the 31st of March 2013);
- ☞ failing which, the registration certificate lapsed on the 31st of March 2013.

AELs must be reviewed at intervals specified in the AEL, or when circumstances make review necessary. If ambient standards are exceeded in an area, an AEL can be tightened up to achieve the standards. The AEL can also be varied if it is in the public interest to accommodate demands arising from impacts on socio-economic circumstances. It may be that this was intended to protect people from pollution, but it is notable that ArcelorMittal sought to justify a variation in its AEL on socio-economic grounds following a fire that forced it to close the basic oxygen furnace at Vanderbijlpark. It argued that the loss of steel production had significant socio-economic impacts which justified reopening its polluting electric arc furnaces. Eskom now seeks to vary the AELs of all but one of its coal-fired power stations and two of its gas-turbine stations to allow additional air pollution on similar grounds. It argues, for example, that varying Kriel power station's AEL to increase its emissions is "necessary or desirable to accommodate demands brought about by impacts on socio-economic circumstances, and it is in the public interest

to meet those demands".[13] These cases are described in Chapter 7.

Government is failing to link exceedances of ambient standards with the source of pollution and then to take appropriate action to hold polluters accountable.

The licence-holder may be required to submit an atmospheric impact report (AIR) when an AEL is reviewed. An AIR can also be required if the Air Quality Officer (AQO) reasonably suspects a contravention of the AQA or licence conditions and that this has had, or may have, a detrimental environmental effect (including on health, social conditions, economic conditions, ecological conditions or cultural heritage), or has contributed to ambient air quality degradation. It is an offence to fail to submit an AIR. Monitoring compliance with directives to submit an AIR is the responsibility of all spheres of government. However, we are not aware of an AIR being required of any of South Africa's polluting industries for these reasons. The DEA has not responded to questions on this point.

Government is failing to link exceedances of ambient standards with the source of pollution and then to take appropriate action to hold polluters accountable. Nor does it appear to be using the options to review or vary AELs or to require AIRs. The result is that air pollution – with all of its dangerous health and environmental impacts – continues and polluters are not made to pay.

13 Eskom, Application to vary Kriel Power Station AEL, 15 November 2013, p.2.

At the municipal level, the Framework says that AELs are the primary means for ensuring compliance with ambient air standards, and will be supplemented by AIRs.

Environmental management inspectors must monitor and enforce AQA compliance and can investigate where there is a reasonable suspicion of an offence or a breach of AQA or a condition of an AEL. Inspectors may issue compliance notices and the failure to comply with a notice is an offence.

In general, there is a failure to enforce industries' compliance with AQA and AELs through effective sanctions. Government tends to follow a "compliance strategy" of negotiating with offenders in preference to prosecuting them. There are various reasons for this, including the difficulty and cost of criminal prosecution and the fact that government often has an ongoing relationship with the offender. This means that there is very little threat of a meaningful sanction for offenders and the result is poor enforcement of and compliance with environmental legislation.

Listed activities and emission standards

The Minister must (the MEC may) publish a list of activities that result in atmospheric emissions which are believed to have a significant detrimental environmental effect. Emission standards must be established governing the permissible amount, volume, emission rate or concentration of pollutants that may be emitted from an industrial activity listed in terms of AQA s21. Standards for measuring emissions must also be established. The s21 list of activities published on the 31st of March 2010 requires compliance with minimum emission standards by the

1st of April 2015, and with stricter standards by the 1st of April 2020. There is also provision to apply to postpone such compliance for a maximum period of five years. This is addressed in chapter 7. The s21 list was amended on the 22nd of November 2013.

Every listed activity requires an AEL. Municipalities are the licensing authorities responsible for implementing the AEL system. Factors to be considered when evaluating an AEL application include:

- ambient air and point source emissions standards;
- pollution caused or to be caused by the activity and its environmental effect (including health, social conditions, economic conditions, cultural heritage and ambient air quality); and
- the best practicable environmental options available to prevent, control, abate or mitigate that pollution and to protect the environment.

Among other things, AELs must specify: emission limits; operating requirements relating to emissions, including fugitive emissions; requirements for measuring and reporting emissions and on-site ambient air quality; penalties for non-compliance; and any other provisions necessary to protect air quality.

Provinces, metropolitan and district municipalities – with oversight from the DEA and input from local municipalities – are responsible for monitoring potential illegal listed activities and monitoring compliance with the conditions or requirements of AELs. It is an offence to supply false or misleading information in any AEL application and provinces, metropolitan and district municipalities are responsible for monitoring that they do not.

Priority areas

The Minister or MEC may declare a priority area where ambient air quality standards are exceeded or any other situation exists which may cause a significant negative impact on air quality. The Minister may do so if the poor air quality affects the national interest or contributes to air pollution in another country, and if the area crosses provincial boundaries or the province requests the Minister to declare the area as a priority area.

A priority area air quality management plan (AQMP) must then be developed. The aim is to target limited resources to the areas that need them most and coordinate action. Once an AQMP is implemented, air quality in the area should – within agreed timeframes – be brought into sustainable compliance with the ambient air quality standards. The DEA is responsible for monitoring compliance with the goals of national priority area AQMPs and reporting this in the National Air Quality Officer's (NAQO) annual report. Information in these reports is extremely sparse and does not meet the prescribed requirements.

Three priority areas have been declared – the Vaal Triangle Air-shed Priority Area (VTAPA) was declared on the 21st of April 2006, the Highveld Priority Area (HPA) on the 23rd of November 2007, and the Waterberg Priority Area on the 15th of June 2012. The heavily industrialised Vaal was first up because of its notoriously polluted air and the comparatively well-documented impact on people's health and wellbeing. It provides the focus for this section.

The VTAPA AQMP was developed through a forum of local, provincial and national AQOs and a Multi-Stakeholder Reference Group (MSRG) – including government, industry and VEJA. It was gazetted on the 28th of May 2009, along with the regulations for implementing and enforcing it.

The AQMP identifies eleven "problem complexes", including mining, iron and steel and ferro-alloys, petrochemicals, power generation and biomass burning, and strategies and interventions to address these problems. The regulations create a cycle, with specified timeframes, for developing, implementing, and reviewing strategies and enforcing the AQMP. Identified industrial stakeholders must develop their own emission reduction strategies. They must review these strategies and submit their revised version to the NAQO by the end of June 2014. Thereafter, these strategies must be reviewed and submitted every five years. Missing the deadline is an offence. The Vaal AQMP as a whole will be reviewed in September 2014 and every five years thereafter.

In the Vaal and the Highveld, the AQMP strategies are either not being implemented or are not having the desired effect of improving air quality, as Chapter 5 shows.

> The 2011 NAQO report said that there had been an alarming overall reduction in air quality since 2008.

Air Quality Officers

AQOs, responsible for air quality management, must be designated for each sphere of government and are required to coordinate their activities as set out in the Framework or as prescribed by the Minister. The DEA has been unable to advise us how many provinces and municipalities have failed to appoint AQOs.

It is an offence to provide false or misleading information to an AQO. Provinces, metropolitan and district municipalities have principle responsibility – with oversight from the DEA and input from local municipalities – to monitor that no false or misleading information is provided to an AQO.

AQOs in all government spheres must submit annual reports which are intended to provide information about progress in implementing the AQA and compliance with air quality management requirements. Municipal AQOs submit their reports to the provincial AQOs who use them to compile provincial reports for submission to the NAQO. The draft NAQO Annual Report is then presented to the Annual National Air Quality Governance Lekgotla for ratification.

The 2011 NAQO report said that there had been an alarming overall reduction in air quality since 2008. The high level of particulate matter (PM_{10}) was most concerning and even the national average from all monitoring stations exceeded the ambient standard. Consequently, many people did not enjoy "their Constitutional right to sweet, clean and healthy air" and "increased action" was needed from all spheres of government (NAQO 2011: 49). The DEA indicated that there is no NAQO 2012 report and that the next one has not yet been made available. This is a breach of the Framework requirement to submit annual reports.

Air Quality Management Plans and Reports

Air Quality Management Plans (AQMPs) must seek to improve air quality – to comply with ambient standards – and reduce the impact of bad air on people's health and environment. The plans must also deal with implementation. Relevant national departments and all provinces must prepare an environmental implementation or management plan, which must include an AQMP, and the DEA must produce a consolidated plan. Unless an extension has been granted, these plans must be updated every five years. Municipalities must include AQMPs in integrated development plans (IDPs) required by the Local Government: Municipal Systems Act of 2000.

The DEA's most recent plan is dated March 2008 and does not include an AQMP. It mentions the Framework (developed in 2007) which indicates that it serves as the DEA's AQMP. However, the Framework fails to meet the requirements for an AQMP contained in the AQA. The DEA has published draft guidelines on the development of environmental implementation and environ-

mental management plans and is currently reviewing the comments received. It now says that its own environmental implementation and management plan, including the AQMP, will be developed in the 2013/2014 financial year.

The DEA was not able to tell us which other organs of state had failed to produce an AQMP but a November 2011 report, entitled "An Assessment of the National Air Quality Management Planning Status Quo Report" (Status Quo Report), says:

> *Even though AQMPs are required by law within these various spheres of government, many authorities have still not developed an AQMP (p.1).*
>
> *67% of authorities had included their AQMP into the IDP/EMP/EIP (p.12).*
>
> *No national department AQMPs were noted. Twenty four (24) AQMPs have been completed in South Africa with six (6) AQMPs in progress. A total of thirty one (31) district municipalities, four provinces and one metropolitan have not yet embarked on the process (p.4-6).*

Of the municipalities listed in the Framework as requiring special attention and the development of a detailed AQMP, 61% had developed AQMPs and another 3% were in progress. So 36% were ignoring – or ignorant of – the obligation.

> *In general, the assessment showed that all national departments that are required to develop EMPs/EIPs have done so, with the exception of the Departments of Environmental Affairs and of Tourism. In terms of AQMP development, no department has developed an AQMP. It is only the departments of Energy and of Mineral Resources that*

have, in their EMPs, characterised the nature of their air quality impacts and the plans/measures to address issues of air quality associated with their activities (p.33).

Every state organ must report annually on the implementation of its environmental management plan to the DEA's Director-General. These reports must contain information on the AQMP's implementation, including the level of compliance with ambient air quality standards and measures taken to comply with those standards, compliance with any priority area AQMPs, and its air quality monitoring activities. The information in the DEA's own Annual Report 2012/13 is extremely sparse and does not meet these requirements. It does not mention that the Framework is regarded as the DEA's AQMP. It therefore fails to comply with NEMA s16 and AQA s17. The Status Quo Report comments:

Section 17 of the AQA notes that annual reporting on the implementation of the AQMP should be made. In some instances this is not being undertaken and should be viewed as a level of non-compliance of the Act (p.35).

State of Environment Reports

State of the Environment Reports should describe baseline environmental conditions against which to measure changes, according to the Framework, and so help to prioritise and set environmental management goals. They include a chapter on the state of the air which must be reviewed every five years and include:

- AQM initiatives;
- indicators to measure ambient air quality;
- information on ambient air quality standards, monitoring activities, listed activities and emissions, and status and trends of ambient air quality.

The last State of the Air report was produced in 2005. The 2012 South Africa Environment Outlook Report has been prepared and includes a chapter on air quality. The report is currently with the Minister and a decision must be made as to whether or not it requires Cabinet approval.

Conclusion

South Africa has inadequate air quality monitoring capability and limited air quality data. There is a pressing need to expand and improve the network of air quality monitoring stations and the capacity to assess people's exposure to the pollutants monitored.

Government planning and reporting on air quality is not compliant with legislative requirements and this clearly has a negative impact on air quality management.

This is exacerbated by the lack of resources – both financial and human – in a highly technical arena. The dearth of skills and capacity is worst in local government. This is of particular concern given municipalities' crucial obligations in relation to air quality management. Both the NAQO's 2011 Annual Report and the Status Quo Report observe that considerable government capacity-building is required for effective

implementation of planning, management and enforcement.

Compliance monitoring and enforcement of AQA obligations is also a major challenge. Provinces must ramp up their monitoring of municipal performance. Where local government is failing to perform adequately, the national and provincial governments must intervene, as is their constitutional responsibility. Cooperation and coordination of government departments must be improved.

South Africa has inadequate air quality monitoring capability and limited air quality data. There is a pressing need to expand and improve the network of air quality monitoring stations and the capacity to assess people's exposure to the pollutants monitored. SAAQIS must be urgently improved. Robust, reliable data is essential for the implementation of improvement measures.

National policies and programmes on air quality should be reviewed and improved to protect human health and the environment. Similarly, as WHO Guidelines indicate, air quality standards should be regularly reviewed and revised when there is new scientific evidence about health impacts.

Urgent action must be taken to ensure compliance with AQA to better protect human health and the Constitutional right. The failure to do so seriously inhibits the achievement of environmental justice.

5. What government has monitored and failed to monitor

Rico Euripidou

The Multi Point Plan (MPP) for the South Durban Basin was announced in November 2000 by Valli Moosa, then Minister for Environmental Affairs. The announcement responded to the evident collapse of the apartheid-era APPA regulatory regime and marked the beginnings of a new regime that was eventually signed into law as the AQA. Thirteen years on, it seems that the AQA regulatory regime is collapsing.

The eThekwini Multi Point Plan (MPP)

The MPP was to develop an air quality management system backed by a state of the art continuous air quality monitoring network. In 2003, the eThekwini Municipality commissioned just such a monitoring network as a key component of its Air Quality Management System. The network is composed of instrumentation owned by eThekwini Municipality and operated by the City Health Department's pollution control and risk management unit.

The network instruments continuously measured the priority pollutants sulphur dioxide (SO_2), oxides of nitrogen (NOx), particulate matter with a diameter less than ten microns (PM_{10}), particulate matter less than 2.5 microns ($PM_{2.5}$), ozone (O_3) and carbon monoxide (CO). Measurements of total reduced sulphur (TRS) are also taken.

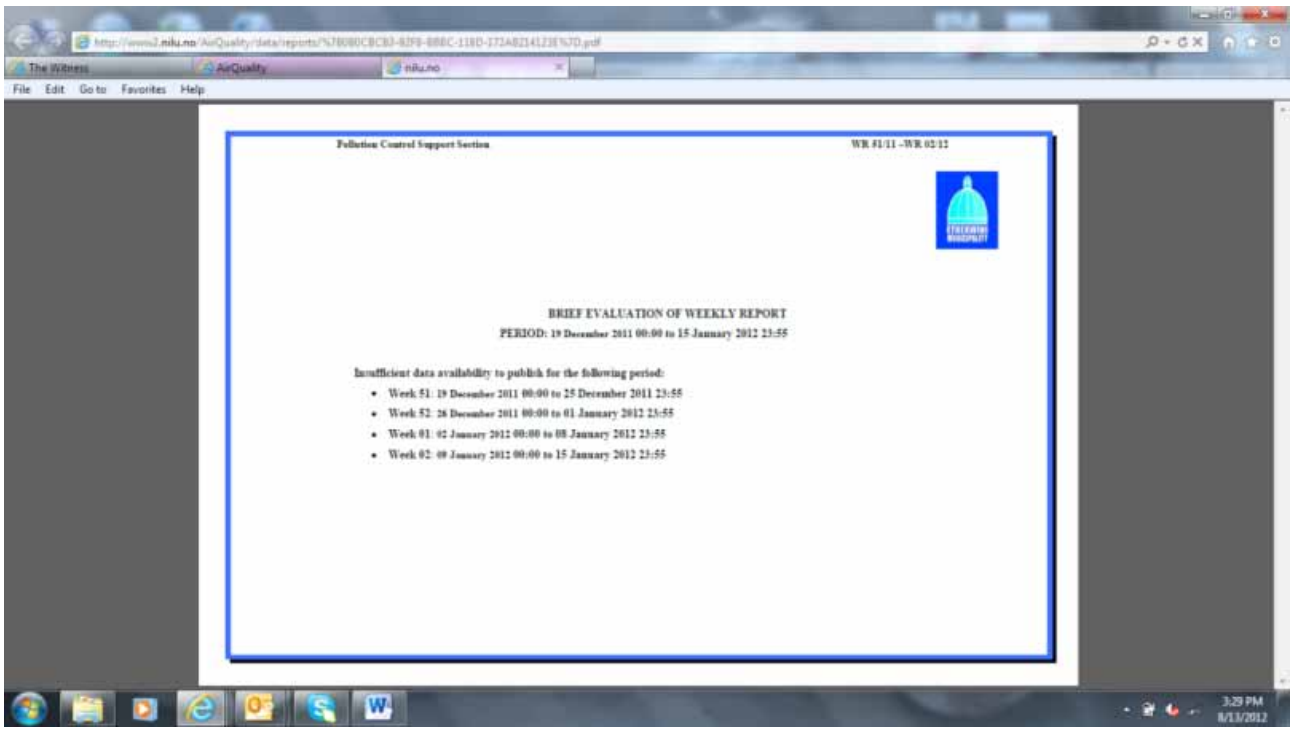


Figure 1: A computer snapshot showing the failure of the eThekwini air quality management system. For the whole of 2012 and 2013 there is insufficient data to publish reports over the weekly reporting period. Reasons are said to include staff shortages leading to poor upkeep and maintenance, equipment failure and theft.

All analysers were designated under United States Environmental Protection Agency (USEPA) regulations as equivalent methods.

The primary objectives of the network were to monitor air quality in eThekwini and particularly in south Durban, measure compliance with air quality standards and provide a means of verification for dispersion models. The network consists of twelve air monitoring stations, three of which are background stations and five are meteorological stations. It was considered so successful by the national Department of Environmental Affairs (DEA) that it showcased the eThekwini MPP air quality management system as a model for future Air Quality Management Plans (AQMPs) required in terms of sections 15 to 17 of the AQA. The DEA's case study of the MPP (DEAT 2007) was one of the outputs of its national AQMP implementation project and it had a two-fold purpose:

i. To provide a reference document for other AQMP Implementation project outputs, and
ii. To be used as an inspirational example for other municipalities to follow on how the plan was implemented and lessons learned would be used by other authorities as a learning tool to apply to their own pollution problems.

The eThekwini Unit went on to win a national award in 2007. In 2011, however, the eThekwini's pollution control and risk management unit was systematically dismantled. A restructuring plan reduced the staff complement by nearly 75% and provoked the resignation of its head, Siva Chetty. *The Mercury* reported that an unnamed senior departmental official had said: "There are a lot of concerns about plans to absorb the permanent pollution staff into other areas of the

health department and it looks like there will no longer be a stand-alone air pollution section."[14]

It is not clear why the unit was dismantled. It was reported that the newly appointed City Health chief, Nomakhosi Gxagxisa, did not view air pollution as a priority for eThekwini and wanted to focus on primary health care. If so, the reasoning was flawed. The South Durban health studies found very high levels of respiratory illness. Merebank primary school children have one of the highest asthma rates in the world and are very vulnerable to pollution. Further, the risk of contracting cancer in south Durban is 250 times the norm.[15]

Bobby Peek of groundWork noted that Chetty's resignation could not have come at a worse time, as KZN Premier Zweli Mkhize had just announced plans to expand the petro-chemical industry in south Durban. He asked, "It is possible that Siva's resignation is linked to internal politics, but how do we know that heavy industry has not been lobbying to move him aside? Perhaps there was a fear that his department was becoming a bit too powerful?" [16]

Whatever the reason, Gxagxisa could not have ripped into this unit without the knowledge and consent of senior city managers.

At the time of writing, eThekwini's pollution control and risk management unit is still there, but grossly under-staffed and without a permanent senior leader. It is kept in a state of collapse. In consequence, the air quality monitoring infrastructure has also collapsed. What was once a model air quality management system was not able to produce one validated weekly report of air quality in 2012 and 2013. This is a failed system which no longer has the means of assessing whether industry is complying with the law.

The continued failure to implement the recommendations of the South Durban Health Study

Relatively modest increases in pollution levels affect the lung function of vulnerable people and people exposed to pollution become more vulnerable to it.

The South Durban Health Study (Naidoo et. al.) was written by a team of local and international health experts in 2006, when the eThekwini monitoring network was fully functional. They nevertheless called for enhanced monitoring both of "conventional pollutants" and "contaminants of potential concern" which create significant cancer and non-cancer health risks. They found "substantial, consistent associations between ambient concentrations of the four pollutants assessed, NO_2, NO, $PM_{10,}$ and SO_2, and adverse effects on lung function in children". Relatively modest increases in pollution levels affect the lung function of vulnerable people and people exposed to pollution become more vulnerable to it. They emphasised the importance of continued air quality monitoring, the urgency of reducing ambient environmental pollution and the need to identify and control emissions sources. Further recommendations included:

14 Tony Carnie, ***Fears for Durban polluter watchdog***, The Mercury, February 28, 2011.

15 See amongst others: Kistnasamy J. et al, 2008; Naidoo, R. et al, 2006 and DEAT 2007.

16 Quoted in Tony Carnie, ***Fears for Durban polluter watchdog***, The Mercury, February 28, 2011.

i. Early warning systems linked to schools that are close to pollution sources should be developed, and asthma awareness and asthma education should be promoted.
ii. An enhanced Volatile Organic Compound (VOC) monitoring network should be established, particularly where residents live in close proximity to the oil refineries.
iii. Robust and permanent $PM_{2.5}$ monitoring sites should be established, with traffic-oriented, industry-oriented, population-oriented and background sites suggested.
iv. Given the diversity of small and large industry in south Durban, a wider set of metals should be collected and analysed.
v. An assessment of residential environments showed that 20% people surveyed used paraffin stoves, leading to high levels of indoor pollution (specifically carbon monoxide, PM and VOCs) and serious health effects. Hence, housing conditions should be improved and the use of paraffin (and similar fuels) without ventilation discouraged and ideally phased out.

To date, not one of these recommendations has been meaningfully implemented by the eThekwini City Health Department. Furthermore, no health surveillance data linked directly to air pollution health outcomes is collected. This does not allow for a validation of the question the health study set out to answer: "Are improvements in air quality in south Durban linked to improvements in population health?"

The primary objectives of the eThekwini network were to quantify the quality of air in South Durban in particular, and eThekwini

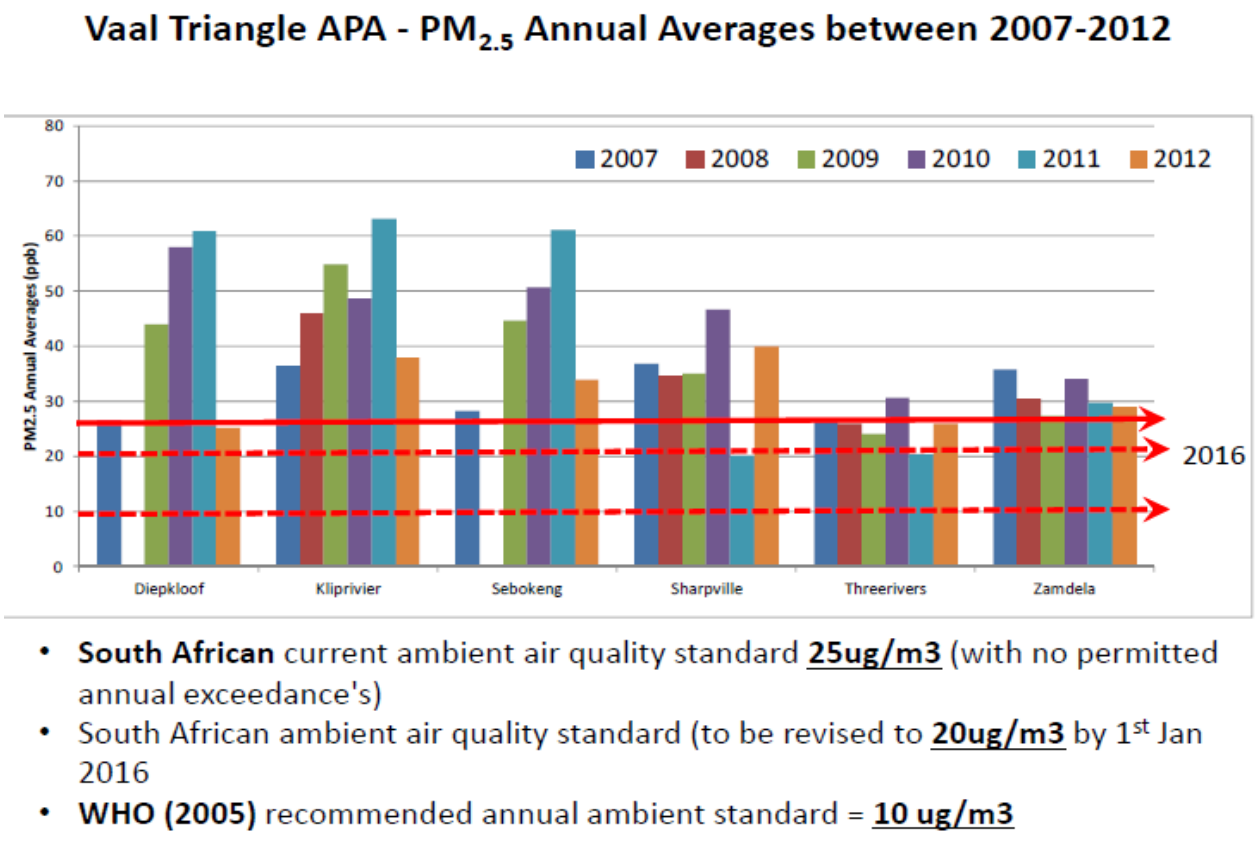


Figure 2a: Vaal PM_{10} annual averages.

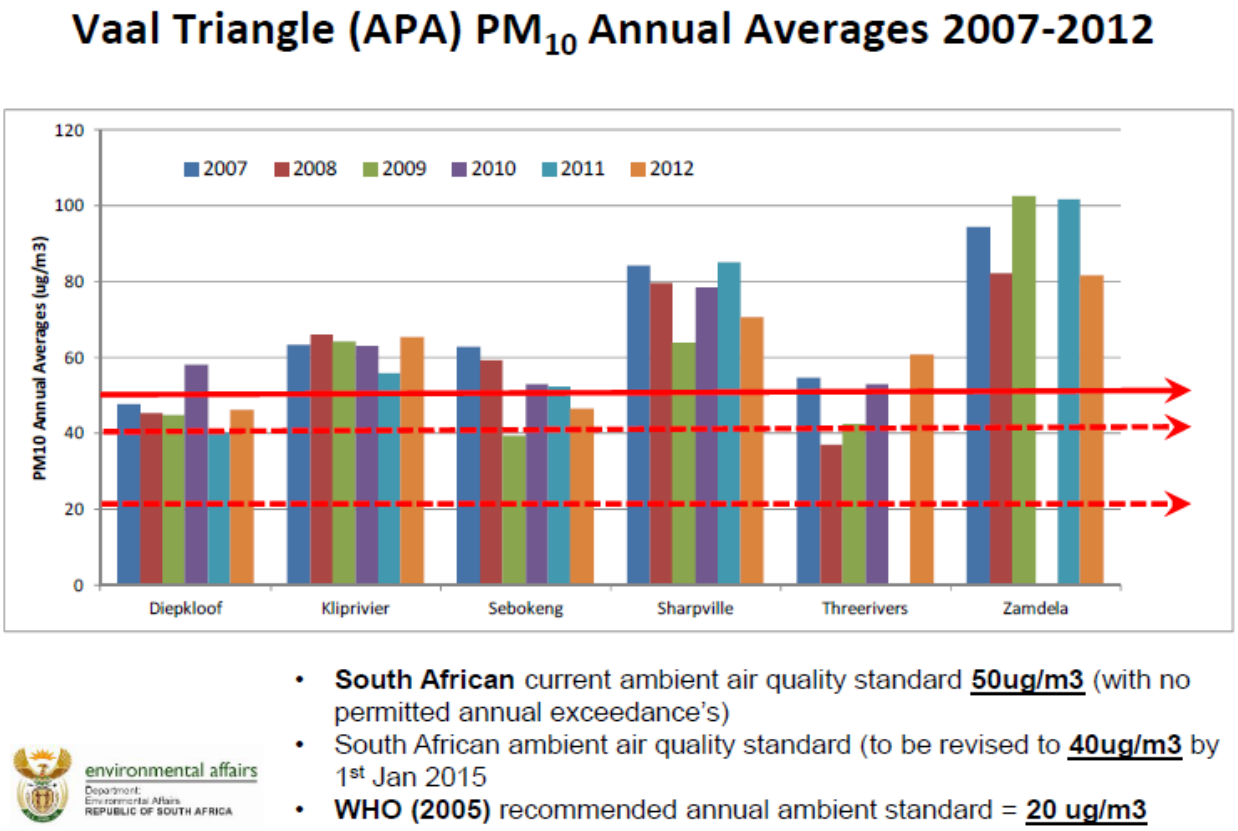


Figure 2b: Frequency of PM_{10} exceedances in the Vaal.

in general. They are not being met. The once state-of-the-art air quality unit with modern technology is not even able to measure compliance with air quality standards.

The Vaal Triangle Airshed Priority Area: Air Quality Monitoring Network

The Vaal was the first area to be declared an air pollution hotspot. Following this, a network of six ambient air monitoring stations was established in the Vaal Triangle Airshed Priority Area (VTAPA). The stations are operated and maintained by the South African Weather Service and measure the conventional pollutants (PM_{10}, $PM_{2.5}$, sulphur dioxide, nitrogen oxides, ozone and carbon monoxide) and VOCs (benzene, toluene, ethylbenzene and xylene).

The goal of the VTAPA Air Quality Management Plan (AQMP) is to bring the air quality of the area "effectively and efficiently" into sustainable compliance with national ambient air quality standards within agreed timeframes. To do this, the plan sets the following objectives:

- ☞ to reduce emissions (from various sources) to acceptable concentrations;
- ☞ to minimise the impacts from biomass burning;
- ☞ to minimise both fugitive dust and gaseous emissions from operations; and
- ☞ to achieve acceptable pollutant emissions through best practice management techniques.

However, more than five full years after the implementation of the VTAPA AQMP, none of the stated objectives have been achieved and the quality of air is nowhere near the stated

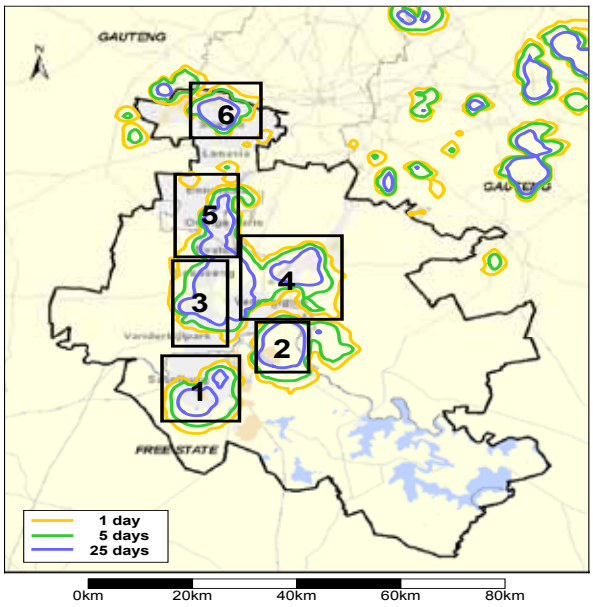


Figure 2c: Vaal Triangle Air Priority Area $PM_{2.5}$ annual averages

goal for the most basic air quality indicator (PM_{10}). Figure 2a, sourced from the DEA, shows how badly the annual PM_{10} ambient air quality standard is exceeded. Figure 2b shows how frequently the twenty-four-hour PM_{10} standard is exceeded at each of the six monitoring stations. The inner purple rings show where the standard has been exceeded on twenty-five or more days in the year. Figure 2c shows the exceedance of the annual $PM_{2.5}$ standard at all stations. Commenting on the development of this standard, the National Air Quality Officer's 2011 Annual Report says, "Given that $PM_{2.5}$ is more of a health hazard than PM_{10}, the project is aimed at developing a National Ambient Air Quality Standard that is protective of human health and the environment" (p.3). The standard is, however, rather less demanding than that recommended by the WHO.

These figures demonstrate that emissions from the industrial complexes of the Vaal Triangle have not been reduced. The big corporations continue to pollute with impunity. Municipalities have not developed good oversight of air quality monitoring or management and "best practice management techniques" have not been achieved. The VTAPA is failing.

From looking at the VTAPA AQ monitoring data one can see certain patterns and make some general observations. There is a very strong and clear seasonal variation of pollutant concentrations, as can be expected given the meteorology of the Vaal. The winter inversion leads to a significant increase of pollutant concentrations from about May, with the largest increases being observed for SO_2 and PM_{10} and $PM_{2.5}$. Further, episodes of high PM_{10} coincide with episodes of very low temperatures. These exceedances are observed across the entire monitoring network, suggesting non-localised influences from similar sources such as coal-fired power stations and steel mills. Following this logic, we conclude that industry is most likely to be the primary cause of air pollution in the VTAPA. Targeted investigations and monitoring would easily determine the sources, but have not been done.

How to improve the VTAPA AQMP

Several steps can be taken to improve air quality in the VTAPA so as to protect people's health. We need a better understanding of what people on the industrial fencelines are exposed to and where it comes from. The AQMP should provide for real time and online monitoring of emissions from priority industries. This would have two aims:

- ☞ First, to correlate source emissions with exceedances of the ambient air quality standards on a daily basis and so inform what steps must be taken to ensure compliance and hold industry accountable.

☞ Second, to create an evidence base on emissions and emissions reductions that can be linked to the aim of reducing illness and death from pollution-related diseases – particularly respiratory illness and cancer.

The AQMP should provide for educating communities on human rights, air pollution and health effects in the Vaal, specifically educating learners, parents and teachers on how to prevent and manage asthma. Health authorities should provide in-service training on asthma diagnosis, management and care to health care professionals, including nurses and doctors from the private and public sectors, so as to provide better care to communities affected by pollution. The health authorities should also monitor and document the prevalence of asthma and asthma-related complications among children in the Vaal Triangle. This should be part of a wider project to collect health statistics to show the distribution of pollution-related disease and inform further revisions of the VTAPA AQMP.

Figure 3: Highveld Priority Area and monitoring stations.

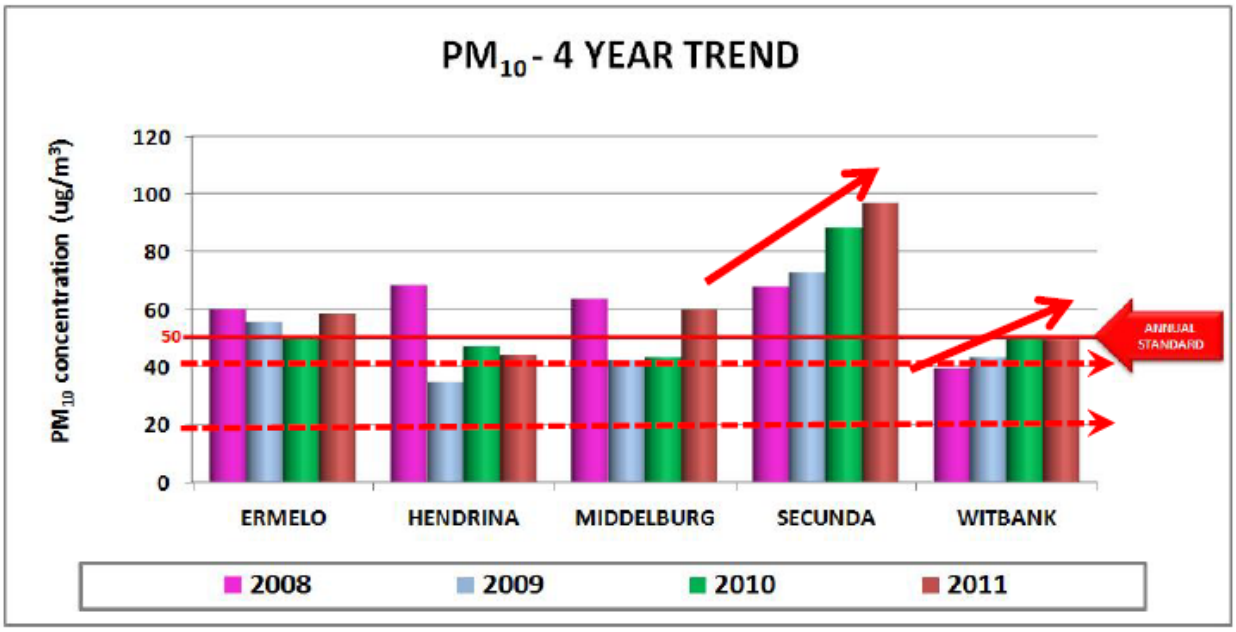
The Highveld Priority Area (HPA): Air Quality Monitoring Network (AQMN)

The Highveld was the second priority area declared. It is a very large area crossing from Mpumalanga to Ekurhuleni in Gauteng. Five ambient air monitoring stations have been established in Mpumalanga at the towns indicated on the map. The DEA contracted out the operation and maintenance to SI Analytics in 2008. The stations monitor the same pollutants as those in the Vaal, but with the addition of mercury.

Up until 2011, SI Analytics produced monthly reports, but provided them to the municipalities within the HPA some months later. So, municipalities have had access to their air quality monitoring data months after the event. While municipalities are legally responsible for managing air quality, they do not have ownership of the data and do not appear to have demanded it. This is symptomatic of the failure to develop municipal capacity to interpret, investigate and mitigate air pollution within their jurisdictions. As in the Vaal, the Highveld is no closer to compliance with South Africa's weak ambient air quality standards than it was five years ago when it was declared a priority area. To the contrary, figure 4a shows increasing concentrations of PM_{10} measured at some monitoring stations. Figure 4b shows very large $PM_{2.5}$ exceedances.

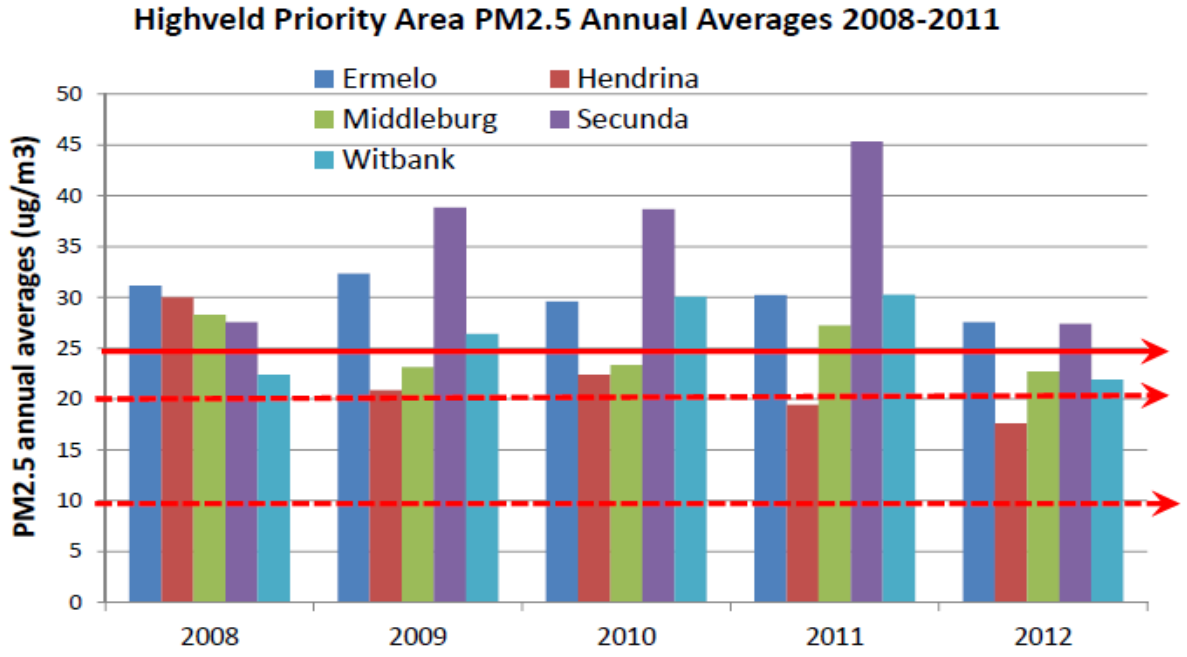
The overall objective of the HPA AQMP reads: "Air quality management initiatives within the Priority Areas are efficiently and effectively identified, prioritised, developed, informed and monitored through, in part, the availability of effective ambient air qual-

Highveld Priority Area PM10 Annual Averages 2008-2011



- **South African** current ambient air quality standard **50ug/m3** (with no permitted annual exceedance's)
- South African ambient air quality standard (to be revised to **40ug/m3** by 1st Jan 2015
- **WHO (2005)** recommended annual ambient standard = **20 ug/m3**

Figure 4a: Highveld PM10 Annual Averages



- **South African** current ambient air quality standard **25ug/m3** (with no permitted annual exceedance's)
- South African ambient air quality standard (to be revised to **20ug/m3** by 1st Jan 2016
- **WHO (2005)** recommended annual ambient standard = **10 ug/m3**

Figure 4b: Highveld PM2.5 Annual Averages

ity monitoring networks." This objective has not been met.

The HPA AQ monitoring data shows similar patterns to those observed in the VTAPA. Once again, South African and international health-based standards are exceeded by a long way. Exceedances of $PM_{2.5}$ are observed across the entire monitoring network, suggesting non-localised influences from similar sources such as coal-fired power stations, metals smelting, mining and steel mills. We conclude that industry is also most likely to be the primary cause of air pollution in the HPA. Targeted investigations and monitoring would easily determine the sources, but these have also not been done to date by the municipalities within the HPA.

6. What groundWork and communities have monitored

Rico Euripidou

Indoor and outdoor pollution are still major concerns in the Vaal Triangle and the Highveld, particularly in the winter. People still rely on fossil fuels for spacial heating and cooking and, although pollution from residential areas is minor compared with industrial emissions, it has a major health impact because it is emitted where people live. It is of particular concern that government's response to this has been reduced to promoting the *Basa Njengo Magogo*. This is a method for lighting fires by placing the kindling on top of the coal so that the fire burns down. This reduces coarse particulate (PM_{10}) emissions visible as smoke from the start up,

but does not reduce sulphur dioxide or volatile organic compounds from burning coal.

The Vaal Environmental Justice Alliance and community groups in the Highveld partnered with groundWork to do some monitoring of their own. They used a MiniVol,[17] a monitoring tool which is accredited by the US Environmental Protection Agency, to measure the concentration of PM_{10} over twenty-four hours and also to test for the presence of heavy metals. Annex 1 summarises some of the health effects of exposure to toxic metals.

In September and October 2011, community people took indoor and outdoor samples in Vanderbijlpark and Boipatong in the Vaal. Of four samples taken, two showed extremely high levels of PM_{10}. One was double the interim national twenty-four-hour standard (120 ug/m^3) and the second was five times higher than the standard. A third reading showed levels just below the present standard but well over the future standard (75 ug/m^3), due to be introduced in 2015. In comparison with the World Health Organization (WHO) recommended standard (50 ug/m^3), the results are even more alarming. The samples also showed that a range of metal toxins are present in the air, including mercury, lead, chromium, magnesium and arsenic.[18]

Highveld samples were taken in the winter of 2012. People from KwaZanele (Breyton), Ermelo, Mhluzi (Middleburg), eMalehleni and Arbor used the MiniVol to take indoor air samples in thirteen households. Ten samples (77%) measured PM_{10} above the interim standard (120µg/m^3) and five (38%) measured it at twice this standard. One household specified that they use the Basa method to light their coal stove, but

Table 4: Highveld indoor BTEX 24 hrs monitoring results (ug/m^3).

Sample	Benzene	Toluene	Ethyl Benzene	Xylene
OM740	54.33	18.39	3.43	6.33
OM737	16.13	18.93	2.99	10.99
OM739	21.91	20.06	3.17	10.51
OM736	3.35	17.62	1.76	6.47

17 Airmetrics, in conjunction with the US EPA, developed the patented low-flow technology found in the MiniVol Portable Air Sampler to address the need for portable, ambient air sampling. ***http://www.airmetrics.com/company.html***

18 The filters were digested using an aqua-regia digestion. The digests were analysed by ICP-MS by Talbot & Talbot Laboratories in Pietermaritzburg.

the sample still showed 194µg/m^3. The highest level of 458µg/m^3 was recorded in Arbor, a community situated next to a coal mine. All the samples also showed significant levels of metal toxins in the air. Of particular concern are mercury, lead, cadmium, chromium and manganese, which are toxic when breathed in, even in very small quantities.

Over the same period, the Highveld communities also tested indoors for BTEX, using passive sampling tubes exposed over a twenty-four-hour period in four households. BTEX stands for Benzene, Toluene, Ethyl Benzene and Xylene. These are volatile organic compounds commonly associated with burning fossil fuels. Table 4 shows that all exposed tubes recorded that all the BTEX chemicals were present. Three of the four samples show high concentrations of benzene.

There is no twenty-four-hour standard for benzene. South Africa's annual standard is 5µg/m^3. The WHO has not developed a guideline value, but this reflects the international norm. Although it is not entirely appropriate to compare a twenty-four-hour monitoring period to an annual standard, it does give us something to compare the concentrations measured in people's homes with. Further, it must be noted that benzene is carcinogenic and no safe level of exposure can be recommended. Sustained exposure to these concentrations over the five-month winter period would pose a significant risk, especially for children.

Summary of community monitoring

The evidence of both community and official monitoring indicates several areas of concern:

- ☞ Pollution levels are alarmingly high indoors and outdoors in the Vaal and Highveld priority areas. Moreover, official data shows no progress towards achieving compliance with standards.
- ☞ The standards themselves are not strict enough to protect people's health. Moreover, full compliance with several standards is delayed until 2030.
- ☞ In eThekwini, the official air quality monitoring system has collapsed. In the Vaal and Highveld, there are very large gaps in the official monitoring data.
- ☞ Atmospheric Emissions Licences (AELs) are not being reviewed and implemented.
- ☞ Environmental Impact Assessment (EIA) regulations are once more being streamlined to fit with the Infrastructure Development Bill. The already lax scrutiny of new developments will be further relaxed.
- ☞ In the priority areas, local government capacity to manage air quality has not been developed. The municipalities do not have ownership of air quality data and nor do they show any intent to take ownership of it.
- ☞ The national leadership of the DEA is ineffective. It is the lead agency in the three priority areas and is supposed to support the development of local capacity. In the case of eThekwini, it seems that the DEA did not notice the collapse of capacity or the sudden absence of data.

7. Review of non-compliance of industries

Robyn Hugo

The AQA creates various obligations for regulated industries and various offences for failing to comply with those obligations. For instance, as noted in chapter 4, it is an offence to conduct a listed activity without an Atmospheric Emission Licence (AEL), to contravene or fail to comply with the terms of an AEL, or to supply false or misleading information in an AEL application or to an Air Quality Officer (AQO). A person convicted of an offence may be fined up to R5 million and/or imprisoned for up to five years and, for subsequent convictions, the maximum fine and jail time are doubled. In deciding the penalty, courts must consider the impact of the crime on people's health, well-being and safety and on the environment, the monetary or other benefits derived from the crime, and the convicted person's contribution to the overall pollution of the area.

Part 2 of NEMA also applies to all Specific Environmental Management Acts (SEMAs), including the AQA. Part 2 of NEMA provides for the designation of environmental management inspectors (the so-called Green Scorpions) who have wide-ranging powers to investigate, inspect and enforce compliance. They can, for instance, conduct routine inspections, issue compliance notices, seize items and stop and search vehicles, vessels and aircraft.

NEMA provides for the recovery from the polluter of losses or damage caused by environmental crimes listed in Schedule 3 (such as commencing a listed activity without a licence or contravening the conditions of a licence). The state or a private party can claim costs for rehabilitating the environment and for losses or damages in the criminal trial without lodging a separate civil claim. A court can also assess the financial advantage gained by an offender as a result of the environmental crime and order that the offender pay this amount as compensation, a fine or damages. Alternatively, the court may order the offender to undertake remedial measures. The convicted person can also be ordered to pay the costs of the investigation and prosecution of the offence.

NEMA holds employers and company directors criminally liable for environmental crimes committed by their employees or companies. They are presumed guilty, along with the managers, employees or agents who, in the course of their work, committed the crime. Proof of the crime constitutes *prima facie* evidence against the employers who will be liable to a fine unless they can show that they took all reasonable steps to prevent the crime. If a firm commits an environmental crime, the directors are personally criminally liable if they failed to take all reasonable steps to prevent it. On convicting a person (or firm), the court may withdraw any authorisation (such as an AEL) that was abused, and disqualify the person from getting another licence for up to five years. It may declare any item used in connection

Despite all of the legislation that has been promulgated to protect the environment, and the measures introduced to make it easier to prosecute environmental crime, the environment continues to be degraded at an alarming rate.

with the offence to be forfeited to the State. It may also order a reward to anyone who helped bring the offender to justice.

Despite all of the legislation that has been promulgated to protect the environment, and the measures introduced to make it easier to prosecute environmental crime, the environment continues to be degraded at an alarming rate.

Since 2007, seven National Environmental Compliance and Enforcement Reports (NECERs) have been published. They report on what the environmental authorities have done to enforce compliance and they aim to deter "would-be offenders who realise there are dire consequences for those who choose to flout environmental laws" (NECER 2011-12: 4). The Green Scorpions hand criminal cases to the National Prosecuting Authority (NPA), which decides whether or not to prosecute. Table 5 shows the results. Most of the cases are for poaching and the drop in numbers after 2009/10 is largely because the DEA's marine unit was moved to what became the Department of Agriculture, Forestry and Fisheries. The 2011/12 NECER gives examples of only two successful prosecutions under the AQA.

However, most complaints registered by the DEA relate to air and water pollution and illegal dumping. The NECERs show that several large corporations are repeat environmental offenders and many are not in compliance with the AQA.

Eskom is the organ of state with the highest rate of non-compliance with environmental legislation in 2011/12. The DEA has instituted several administrative enforcement interventions and criminal proceedings against Eskom. For its part, Eskom has commenced various activities without the required licences – a criminal offence – but then submitted section 24G NEMA applications that allow it to pay an "administrative fine" and apply for the licence after the fact. The number of section 24G submissions from Eskom shows that it is not deterred by having to pay fines. Eskom also procures goods and services from organizations that break the law. For instance, it was reported in December 2012 that twenty-one mines supplying coal to Eskom were operating without a water-use licence.[19]

Table 5: Environmental prosecutions

	Cases referred to NPA	Cases declined by NPA	Arrests	Convictions	Plea bargains	Acquittals
2009/10	282	214	2,384	673	134	1,026
2010/11	234	21	1,988	72	19	22
2011/12	201	20	1,339	82	13	7
2012/13	268	37	1,818	70	14	8

19 Eskom coal suppliers still awaiting water-use licence, Engineering News, December 4, 2012 at http://www.engineeringnews.co.za/article/eskom-coal-suppliers-still-awaiting-water-use-licence-2012-12-04.

In 2011/12, three Eskom power stations – Lethabo, Matimba and Camden – were non-compliant with air and waste regulations. Examples include:

At Matimba – the storage of coal without the requisite AEL, fugitive dust emissions from ash transfer points, and the operation of an unlicensed waste disposal site;

At Lethabo – non-compliance with the conditions of the Environment Conservation Act 73 of 1989 (ECA) permits and APPA permits; and

At Camden – exceedances of the air emission limits, and "significant" non-compliance with the conditions of the relevant authorisations.

In relation to poor management of waste water at Camden, the NPA decided that it could not prosecute Eskom because NEMA s48, at the time, excluded criminal liability for State organs. However, the docket has been returned to the Green Scorpions "for further investigation in relation to individuals who may be criminally liable in their personal capacities" (NECER 2012-13: 49). Eskom was served pre-compliance notices in August 2012. Following representations and a further compliance inspection, the DEA decided not to take further administrative action against the facility in relation to those non-compliances."

In June 2013, Eskom applied to be exempt from and/or to postpone compliance with the minimum emission standards (MES) for all but one of its coal-fired power stations (and two of its gas turbine stations). This is notwithstanding the fact that all of Eskom's power stations are located in AQA priority areas, where air pollution is already a serious problem (or, in the case of the Waterberg, will be in the near future). Eskom argued that, despite the fact that the MES were extensively negotiated and debated in a multi-stakeholder forum over an extended period, and that it has been aware of the MES for many years, it was unable to comply with the MES. The reasons provided by Eskom include: the expense of installing the required pollution abatement equipment; the lack of water (water is required for certain of the abatement measures); and the risk of load-shedding while emission controls are installed.

Eskom is the organ of state with the highest rate of non-compliance with environmental legislation in 2011/12.

Despite the wealth of evidence regarding the serious health impacts of coal-fired power stations, Eskom stated in its Background Information Document (BID) that power station emissions do not harm human health – a statement which it subsequently withdrew – but did not conduct any health assessments to substantiate this assertion. In addition, Eskom's dispersion modelling contains numerous serious flaws, which have resulted in significant inaccuracies regarding how its application will impact on ambient air quality. Although these issues were pointed out to Eskom by the Centre for Environmental Rights (representing groundWork, VEJA, Earthlife Africa Johannesburg and several community organizations opposing these applications), no changes were made to the modelling approach.

At the end of December 2013, Eskom decided to change all of its applications to postponement applications. Given that it is not possible to be exempt from the MES, this

was the correct approach. Although the maximum postponement that can be granted in a single application is five years, Eskom, in numerous cases, wishes to postpone compliance by many years; and, in the case of $S0_2$ (except for Medupi), until decommissioning. In relation to Medupi, Eskom only intends to be in a position to comply with $S0_2$ MES by April 2027. It is clear that such applications – which Eskom refers to as "rolling postponements" – have the same effect as exemptions. In addition to these postponements, Eskom also seeks to vary the AELs for all of these stations; in several cases, not only from April 2015 (when the MES apply), but with immediate effect.

The effect of this is that stakeholders were provided with just over five weeks to respond to thirty-two highly technical applications. The submissions were made on the 12th of February 2014. As part of the opposition to the applications, expert evidence of the health impacts of non-compliance with the MES was obtained. This is likely to have a significant effect of human health, as is addressed in chapter 8. The decision of the NAQO is awaited.

As was forewarned in submissions on the Eskom BID, Eskom's application has set a precedent for other polluting industries. Sasol, Natref, Anglo, Engen, PPC, and Northam Platinum are among the industries that have also submitted applications for exemption from and/or postponement of compliance with the MES.

Sasol's Secunda plant in Mpumalanga was in "significant non-compliance with conditions of numerous authorisations", including APPA and waste permits (NECER 2010-11: 40, and 2011-12: 36). They were still found to be non-compliant in a follow-up inspection. The Green Scorpions have developed an enforcement strategy which includes a review of the relevant APPA and

waste management permits. A follow-up inspection to the facility (during which compliance with the newly issued AEL and waste management licence will be assessed), will determine the type of enforcement action, if any, to be taken.

Samancor's Middleburg plant was found to be non-compliant with its APPA and waste permits and inspectors also found fugitive emissions from the material stockpiles. The follow-up inspection showed that waste handling at the plant was still not compliant. Both administrative and criminal enforcement actions are in process. Samancor has lodged an objection to some of the compliance notices issued to them. Following an October 2012 inspection, it was found that the majority of the instructions had been complied with. This objection has yet to be finalised. A criminal docket has been opened and the case is still under investigation.

Highveld Steel's offences include exceedances of air emission limits, a failure to adequately monitor emissions, and the undertaking of unauthorised APPA scheduled processes. A follow-up inspection showed problems with the secondary emission extraction plan, with maintenance procedures and with shut-downs and start-ups. Pollution was emitted from numerous points in the production process, gas-cleaning equipment was ineffective and regular breakdowns at the iron plants resulted in uncontrolled emissions to the atmosphere.

At ArcelorMittal, environmentally harmful activities included uncontrolled emissions from a blast furnace and a coke battery and dust emissions at the off-loading and storage areas.

The administrative enforcement process is still underway. The DEA has issued various notices to Eskom. On receipt of the requested documentation from Eskom, the DEA will decide whether further enforcement action is required. A criminal investigation has been finalised and the investigating officer is obtaining warning statements[20] from the facility prior to handing over the docket to the NPA for a decision.

ArcelorMittal South Africa is the largest steel producer in Africa and its parent is the largest steel corporation in the world, with operations in sixty countries. The NECERs report numerous instances of non-compliance at various of its facilities. Its Vanderbijlpark plant had not got APPA permits for certain scheduled processes and had not complied with the terms of an authorisation related to the kilns. Environmentally harmful activities included uncontrolled emissions from a blast furnace and a coke battery and dust emissions at the off-loading and storage areas. The follow-up inspection showed ongoing non-compliance and a criminal investigation has been launched.

A final compliance notice was issued on 26 September 2013, with respect to Arcelormittal's non-compliance with the conditions of the AEL which specifically related to the exceedances of particulate matter release limits. This notice included an instruction to cease the operation of certain facilities and associated activities.

In September 2012, the corporation was forced to close down its electric arc furnaces (EAFs) at Vanderbijlpark because they failed

20 A statement taken after suspects have been warned that what they say may be used in evidence against them.

to comply with air quality legislation. The Gauteng Department of Agriculture and Rural Development (GDARD) issued it with a compliance notice for contravening the terms of its AEL – by emitting more PM_{10} than allowed – and gave it thirty days to implement a de-dusting solution. ArcelorMittal responded by closing down the plant's three EAFs. It said that completing a R230 million dust-extraction system to abate emissions from the furnaces was "too costly" and scrapped the project. Its appeal against the notice was unsuccessful but, because it closed the EAFs and complied with other requirements, the notice was withdrawn.

In April 2013, following a major fire which forced the closure of the plant's Basic Oxygen Furnaces (BOFs) and remaining steel making capacity, ArcelorMittal applied to vary its AEL so that it could operate its EAFs again. In fact, it sought to run them for three months while the BOFs were repaired without doing anything about emissions. It also argued that it should be exempt from having to conduct public consultation for this change in the AEL or, alternatively, that a period of seven days should be allowed. The Sedibeng District Municipality agreed to the abbreviated consultation. VEJA objected to: the reduced consultation which fell far short of the "reasonable opportunity" prescribed by AQA; the lack of adequate information to access the application; and to the proposed variation of the AEL. Nevertheless, the Municipality granted the application on the 9th of May 2013, and agreed to provide VEJA with the requested air quality monitoring reports. ArcelorMittal again shut down the EAFs on the 1st of July 2013. NECER 2012-2013 states that the issuance of the AEL application and its conditions, together with the ongoing criminal investigation, will further inform the administrative enforcement process.

The criminal justice system is both overburdened and short on environmental expertise. Where penalties are imposed for environmental offences, they are usually too light to create a serious deterrent.

At ArcelorMittal's Vereeniging plant, an inspection revealed (amongst other things) that particulate emissions to air were causing serious environmental pollution. Criminal investigations are underway.

Natal Portland Cement's Port Shepstone plant was found to be non-compliant on nineteen counts, with the control of fugitive dust emissions being the major issue.

It is apparent that non-compliance with the AQA (and other environmental laws) is pervasive across whole industrial sectors. Possible reasons include weak enforcement by under-staffed and under-funded government agencies operating without adequate resources for investigating and prosecuting environmental crime. The criminal justice system is both overburdened and short on environmental expertise. Environmental law is inherently complex, often technical and expensive to prosecute. Specialist prosecutors are needed to argue cases, but are in short supply, and most judges have little experience of environmental law. Many cases are dismissed and there are few successful prosecutions. Where penalties are imposed for environmental offences, they are usually too light to create a serious deterrent.

This creates a vicious cycle: since it is difficult to obtain a criminal conviction and an appropriate penalty, environmental authori-

ties are discouraged from prosecuting environmental crimes. The effect is to reproduce the poor prosecution rate, resulting in a compliance deficit. Further, officials do not get the opportunity to improve their practical investigative and prosecution skills. On the other side, the low probability of detection, negligible penalties and large financial benefits that flow from non-compliance with environmental legislation result in perverse incentives for regulated industries to flout the law.

Unless these issues are addressed, industry is likely to continue to pollute with impunity.

8. What this means for health

Rico Euripidou

All air pollution is bad for people's health. For some substances, such as SO_2, the effects are well known. However, pollution does not happen one substance at a time and the combined effect of several substances is not well understood but likely to be greater than the sum of the parts. This section does not attempt to review all health impacts but focuses on fine particulate emissions because the global health literature on PM is quite comprehensive and we can show how small increases in pollution levels can have a significant health impact.

Particulate emissions

Airborne particles are classified according to their size. Coarse particles of less than ten microns in diameter (PM_{10}) are dangerous because they are small enough to be drawn into the lungs. Fine particles ($PM_{2.5}$) are even more dangerous because they are drawn deeper into the lungs. Ultra-fine particles ($PM_{0.1}$) are called nanoparticles and are even more dangerous. They penetrate most deeply into the lung and are also taken up systemically – entering cells, disrupting cell signalling and other processes.[21] Nanoparticles are not monitored in the priority areas or anywhere else in South Africa.

The health effects of airborne particulate matter are well described in the health literature. It can cause illness and death through its impact on the blood system and on the blood itself, on the heart and lung system (taken together), and on the respiratory, immune, nervous and reproductive systems. It also causes developmental problems in babies and children. In many cases, there are long time lags between exposure and health effects.

Various studies have looked at the effects of increasing the concentration of fine particulates by ten micrograms per cubic metre of air (µg/m^3). This is the same measure used to define the ambient air quality standards. With each 10 µg/m^3 increase, they find a significant increase in illness and death, for example, an 8% increase in the risk of dying from lung cancer and a 5% increase in the risk of contracting wheezing bronchitis. There is a particular concern about the effects of fine particulates on infants, as each additional 10 µg/m^3 increases the number of infant deaths from respiratory causes. Children are also vulnerable and more likely to develop respiratory symptoms, asthma and reduced lung function. Research for the WHO Air Quality Guidelines corroborates such findings and suggests a significant loss of life from even a 1 µg/m^3 increase in the concentration of fine particulates emitted from a waste incinerator. This loss of life is from fine particulates alone and does not take into account loss of life from other pollutants.

> The fact that government has allowed the air quality management system to deteriorate to the point of collapse indicates a level of indifference to people's health and well-being.

The epidemiological evidence shows similar results wherever communities are exposed to $PM_{2.5}$. Whether it is in the United States or Australasia, Latin America or Europe, China or Canada, people who suffer from respiratory illnesses are more likely to develop cancer and lung cancer in particular, and are more likely to suffer strokes and heart attacks. Not surprisingly, the US Environmental Protection Agency also concluded that exposure to $PM_{2.5}$ increases emergency department visits and hospital admissions. In South Africa, there is dearth of systematic surveillance and research into the health impacts of air pollution in the pollution hotspots. Calculating the health and environmental costs of industrial air pollution and the savings from serious pollution control should be, but is not, a government priority.

21 There is a very large body of literature on fine particulates and health. Full referencing is available on request.

Conclusion

In 2011, the WHO compiled air quality data from 1 100 cities in ninety-one countries and found that people living in many urban areas are exposed to persistently elevated levels of fine particle pollution. The report states, "In both developed and developing countries, the largest contributors to urban outdoor air pollution include motor transport, small-scale manufacturers and other industries, burning of biomass and coal for cooking and heating, as well as coal-fired power plants. Residential wood and coal burning for space heating is an important contributor to air pollution, especially in rural areas during colder months."[22]

Evidence of the harm from coarse particulates (PM_{10}) is equally well established. Even short-term exposures increase mortality by about 0.5% for each 10µg/m3 increase in the daily concentration. An increasing range of adverse health effects has been linked to air pollution, and at ever-lower concentrations – particularly for airborne particulate matter. For both PM_{10} and $PM_{2.5}$, it is unlikely that any standard will fully protect people from harm. Nevertheless, by reducing PM_{10} from 70 to 20µg/m3, air quality-related deaths can be decreased by about 15%.

The standard-setting process should therefore aim for the lowest possible concentrations and, in our view, this should not be higher than the levels advocated by the WHO. But tough standards are not much good unless they are enforced and this in turn relies on reliable monitoring data. That government has allowed the air quality management system to deteriorate to the point of collapse indicates a level of indifference to people's health and well-being.

22 World Health Organization, ***Tackling the Global Clean Air Challenge***, News Release, September 26, 2011. Geneva, Switzerland.

9. From the ruin, looking forward

Government and corporations are complicit in constructing a purposeful ignorance, both by not collecting information and by obstructing access to it under the pretence of state secrecy or its commercial equivalent – corporate confidentiality.

Government is allowing the air quality regime to collapse. The evidence in this report points to the conclusion that this is the intention. For example: monitoring stations are not maintained; relevant health statistics are not collected; the half-hearted attempt to develop a functioning air quality information system, as required by law, has been abandoned; no attempt is being made to build capacity in any of the spheres of government and, where it has been developed, it is destroyed; pollution control budgets are inadequate; the law is offset; non-compliance is being legalised; and the DEA is evidently under instruction from other ministries.

People living on the fenceline of polluting industries fought hard for a credible air quality regime and the AQA did indeed promise a significant advance on the APPA regime. Key characteristics of the old regime, however, have been infiltrated into the new. Government and corporations are complicit in constructing a purposeful ignorance, both by not collecting information and by obstructing access to it under the pretence of state secrecy or its commercial equivalent – corporate confidentiality. The intention is plainly to erase the very grounds of debate, contestation and accountability. Negotiated non-compliance – agreement between government and corporations on the selective suspension of law to the benefit of the corporation – is a second characteristic transferred from the APPA regime. Eskom and its political principals are now pushing for this to be made central to the administration of emission standards, complemented by offsetting.

A third characteristic is increasingly evident: the atmospheric emissions licence supposed to protect society is now being turned into a corporate licence to pollute. Finally, environmental justice organizations, particularly those on the fenceline, demanded emission standards precisely to establish legal grounds for corporate accountability and, where necessary, liability. Prosecutions under the APPA were unheard of, and it is clearly intended that the means of establishing liability under AQA will be wiped away.

We acknowledge those within government, such as the Environmental Management Inspectors (EMI), who are deeply frustrated by the obstructions in the way of the rigorous implementation of the AQA. We think that their influence within the DEA, and the DEAs influence within government as a whole, is diminished. We do not have faith that government intends creating a credible air quality system or that the health of people on the fenceline registers as a priority. We would like to hope that we are wrong. If government wishes to restore trust that

We do not have faith that government intends creating a credible air quality system or that the health of people on the fenceline registers as a priority.

the AQA regime is there for people rather than corporate interests, it should consider the following measures:

- ☞ All listed industries should meet the most stringent emission standards and there should be no exemptions. Strict regulation should also apply to upsets and incidents – such as explosions and fires – which affect people's health and well-being.
- ☞ A transparent air quality information regime was promised when the AQA was promulgated and it is required by law. It must be implemented. This includes: publicly available online access to all AELs; immediate public and online access to all relevant inspection and compliance reports; immediate and public notice of all exceedances to affected communities and authorities; and immediate public and online access to emissions data through SAAQIS and the National Atmospheric Emissions Inventory.
- ☞ Local ambient air monitoring systems must be developed or restored, together with the regulatory authorities' capacity to operate them and use the data for effective enforcement. The practice of outsourcing these responsibilities must end. There must be strong sanctions for authorities and senior officials who disregard their responsibilities or wilfully destroy functioning systems. Routine monitoring must be supplemented by sampling campaigns to establish the range and concentration of chemicals in the air next to toxic industries. All monitoring and sampling information must be immediately available with online access through the regulatory authority. This information must also be linked nationally to SAAQIS.
- ☞ On this foundation of real knowledge and with the participation of local communities, regulatory authorities must develop and implement credible plans to reduce pollution levels. They must be able to assess the cumulative impacts from all sources and be ready to disallow new toxic industrial developments that will result in excessive pollution.
- ☞ There must be real penalties to deter violations. At present, EMIs can issue compliance notices or refer cases to the National Prosecuting Authority for criminal prosecution. Successful prosecution, particularly in the technical field of air quality management, is very difficult and the capacity for it needs to be developed. At present, however, industry can bet on getting away with violations. The DEA should therefore initiate a process to introduce significant civil and administrative penalties, including daily fines for AEL exceedances.
- ☞ SDCEA campaigned for years for a credible health study because government and corporations denied community claims that they carry a heavy burden of death and disease from air pollution. The Durban health study corroborated community claims and the conclusions of that study must be taken seriously and its recommendations acted on. The lessons from that study are relevant to other pollution hotspots as well as to Durban. In particular, the Department of Health must collect health surveillance data linked directly to air pollution health outcomes so as to produce a health impact assessment. Together with the DEA, it

should assess the costs of bad air both for local communities and South Africa as a whole.

People see that the elite agenda will leave them in a wasteland with no prospect of a good life. They are disregarded and ultimately discarded. People will not accept this fate.

For ourselves, we recognise that we must gather our strength through steadfast local organizing, mutual solidarity and participation in the broader movement for environmental, social and economic justice. We will use all means at our disposal to defend ourselves, our neighbours and our environments from the destruction brought upon us by the state and corporate capital. We will investigate and expose this destruction. We will use legal remedies, where appropriate, to access information, hold government to account and challenge corporations. We will use direct actions at all scales to highlight and disrupt the work of destruction.

South Africa is noted for the municipal rebellions that flare up across the country. These are generally called “service delivery protests” and people are indeed angry at the failure of housing, education, health and municipal services. More than that, however, people see that the elite agenda will leave them in a wasteland with no prospect of a good life. They are disregarded and ultimately discarded. People will not accept this fate.