

SECTION 1: THE NATURAL ENVIRONMENT

1.1 THEME: AIR QUALITY

OVERVIEW

Air quality is governed by the distribution of air pollutants, with impacts often being experienced some distance from the pollution source. Long-lived air pollutants such as carbon dioxide, methane, nitrous oxide and chlorofluorocarbons are internationally significant in terms of their distribution and impacts. Short-lived pollutants such as nitric oxide, sulphur dioxide and particulate matter are regionally, and locally, significant in terms of distribution and impacts. Outdoor air quality is generally worse in urban, industrialised areas, whereas indoor air quality frequently constitutes a health hazard in poorly ventilated dwellings, where coal, wood or paraffin are used as fuel (DEAT, 2002).

Air quality is affected by economic activities which introduce pollutants into the atmosphere thereby posing a threat to human health. Furthermore, air quality has the potential to change the climate with but potentially severe on a local and global scale. As large bodies of air cannot be contained, atmospheric pollution can only be controlled at its source.

Cape Metro Council: CSoER. 1998

The atmosphere is a shared resource, with some compounds transported throughout the globe, while others are only transported on a regional/local scale. Many sources of air pollution exist. Those in MCLM range from veld fires to industrial processes and the domestic use of fossil fuels. The driving forces of poor air quality therefore includes both human activities and natural processes (DEAT, 1999). There are two main categories of impacts associated with poor air quality, human health impacts and ecosystem impacts (including flora and fauna).

WHAT ARE THE PRESSURES?

- Fine dust particles from the existing mine dumps are causing severe air pollution. Additionally, these derelict mine dumps are re-mined, producing even finer residue. This residue is dumped on lower lying surfaces adjacent to slimes dams in order to prevent the risk of wind blown particles. These particles, however, are so fine that severe air pollution results from this mining dust.
- Seasonal influences cause unstable air circulation and

Climate Change: Africa contributes about 3.5% to global CO₂ emissions. In addition, South Africa is the single largest contributor to total CO₂ emissions from the African continent (more than 40%) and is ranked as the 15th largest emitter of greenhouse gases in the world (UNEP, 2000). South Africa ratified the United Nations Framework Convention on Climate Change (UNFCCC) in 1997 and is therefore required to fulfil certain obligations under the Convention. South Africa, being a party to this Convention, is required to report to the parties of the UNFCCC (reporting frequency has not yet been determined) its annual emissions of at least carbon dioxide, methane and nitrous oxide. The possible consequences of greenhouse gases vary widely from human health to agricultural impacts.

DEAT, National Core Set of Environmental Indicators, Phase 3: Selection of Indicators and Climate, March 1999

dissipate pollutants in summer, due to the low pressure over the land. In winter, a high pressure exists and pollutants are trapped in stable air and are not dissipated or transported elsewhere (Preston-Whyte and Tyson, 1988).

- Due to MCLM being about 1 600 – 2 000 m above sea level, the levels of oxygen on the Highveld are 20% less than that at the coast. This means that incomplete combustion of fossil fuels often takes place.
- Wind speed and direction influences the rate of diffusion of pollutants. The prevailing wind in the MCLM area is north-northwest, particularly during winter. The wind can turn and blow from the southeast in summer when bringing rain.
- Dust from gravel roads, mostly in townships and informal settlements causes respiratory diseases and eye irritation. This can be prevented through the improvement of road surfaces.
- Combustion of fossil fuels leads to the increase in CO₂, particulate matter, NO_x and SO_x, adding to the Greenhouse effect.
- Smoke in informal settlements due to cooking and heating, causes the formation of acid rain, which can lead to respiratory illness.
- Industries cause pollution of heavy metals (lead), toxic chlorinated organics, CO, SO_x, O₃, HC, hydrocarbons), and NO₂ which have major health impacts.
- The lack of enforcement of Environmental Management Program Reports (EMPRs) and other legal requirements results in the continuation of severe dust and water pollution emanating from slimes dams and derelict sand dumps.



Soul City Informal Settlement

WHAT IS THE STATE?

- No monitoring of air quality is currently taking place in the MCLM, however the air in the MCLM appears to be generally good.
- Air quality apparatus for monitoring was purchased in October 2002.
- The main sources of air pollution in the MCLM are emissions from industrial processes, dust from mine dumps, dust from gravel roads, veld fires, and the domestic use of fossil fuel, landfill sites emitting methane and the illegal burning of tyres and waste, specifically in informal settlements.
- The predominant wind direction in the south-eastern sector of MCLM, where the industrial areas are located, is north-north-westerly which results in air pollutants being directed to the residential areas of Kagiso and Lewisham from Chamdor and Factoria respectively.
- Pollution from domestic sources, namely coal and wood fuelled cooking and space heating, poses significant risk to human health.

- According to the MCLM IDP (2002), climatology in the area appears to be good for the dispersion of air pollution (filming often takes place in the area because of the perceived 'clear air').
- Industrial activity is generally low, with resultant low pollution loading.
- Traffic density is also relatively low, hence the low vehicle emissions, a threat posed in the more densely populated municipalities in South Africa.
- Dust (silica) stemming from mine dumps, can cause respiratory illness, which can be prevented through the stabilisation of residues, improved mine dump management, and the rehabilitation of mine dumps.

WHAT ARE SOME OF OUR PROPOSED INDICATORS?

1. *Greenhouse gas emissions per unit per annum*
2. *Carbon dioxide levels per unit per annum*
3. *Nitrogen dioxide levels (NO₂) per unit per annum*
4. *Sulphur dioxide levels (SO₂) per unit per annum*
5. *Ozone levels (O₃) per unit per annum*
6. *Methane levels per unit per annum*
7. *Particulate and smoke emissions per unit*
8. *Road/pavement status*
9. *Unsurfaced roads (km)*
10. *Number of mine dumps (operational / non-operational / un-rehabilitated)*
11. *Number of air pollution events*
12. *Fossil fuel use (%)*
13. *Car ownership (per 1000 population)*
14. *Proportion of licensed landfill sites (%)*

WHAT IS THE RESPONSE?

- The Atmospheric Pollution Prevention Act (Act 45 of 1965) is the primary mechanism in South Africa for the management and control of air pollution. It sets out the control of noxious and offensive processes, smoke, dust as well as emissions from motor vehicles. The Air Quality Bill (DEAT, 2003), will repeal the Atmospheric Prevention Act towards the end of 2003.
- The South African Air Quality Guidelines are set of air quality guidelines developed by DEAT, which identify the maximum allowable concentrations of air pollutants in the air. These guidelines assist in the application of legislation with regard to air pollution issues. The promulgation of the Air Quality Bill may result in the South African Air Quality Guidelines being revisited.
- The Gauteng Provincial Executive Council has approved a plan for cleaner technology, air and water in the province. The plan will lay the basis for sustainable improvements in environmental management programmes that include controlling pollution and minimising waste. The Department of Agriculture, Conservation, Environment and Land Affairs (GDACEL) has been tasked to undertake detailed planning for these projects. "This is particularly important given the fact that Gauteng is both South Africa's most industrialised and most densely populated province," MEC Mary Metcalfe 2001.

State of the Environment Report for Mogale City Local Municipality, Gauteng
Prepared by Strategic Environmental Focus

Gauteng generates 80% of the country's waste stream. "Our air quality is bad and contains high levels of emissions from industry, mining and transport that are hazardous to human health" (<http://www.gpg.gov.za/publications/2001/septmbr/10.html>, Gauteng News, Sept 2001).

- Mogale City should investigate cleaner technology programmes, e.g., The Sustainable Energy for Economic Development (SEED) initiatives.
- Atmospheric Pollution Prevention (Act 45 of 1965):
 - Part II (Control of Noxious or Offensive Gases) – Sect 8; R 1231 and GN 1776 - Controlled Areas – i.e. whole country;
 - Part III (Atmospheric Pollution by Smoke) – R 1371 - Krugersdorp is a Smoke Control Zone; and
 - Part IV (Dust Control) – R 542 - Krugersdorp is a Dust Control Zone.

WHAT CAN YOU DO?

- Ensure that your family vehicle is using unleaded petrol;
- Report any air pollution incidents to the council;
- Make use of lift clubs, walk or use bicycles, wherever possible;
- Initiate and propose the development of cycling lanes for your neighbourhood linking with open spaces and other neighbourhoods;
- Propose the improvement of road infrastructure in your neighbourhood to reduce dust pollution;
- Take part in public monitoring of air quality standards (e.g. SABS) to ensure that emissions from industries are within the set standards;
- Minimize the burning of fossil fuels in your home where possible, by reverting to alternative cleaner energy sources such as solar energy (e.g. sunstones);
- Schools should participate in the monitoring of air pollution stations.

OTHER LINKS

The impact of air quality also effects:

- Health;
- Local economic development; and
- Tourism.