

# AIR POLLUTION IN THE VAAL TRIANGLE - PLANS FOR THE FUTURE

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## INTRODUCTION

As the title indicates, this talk will focus on plans for the future with respect to air pollution control in the Vaal Triangle. However, in order to sketch a complete picture of the local situation, aspects of a broader nature, like air pollution legislation and problem which should be addressed on a national basis, will also be touched on.

South Africa is in the unenviable situation in facing air pollution problems inherent to both developed as well as developing countries. On the one hand we have serious smoke pollution from coal combustion in non-electrified and informal residential areas which is a major if not the largest source of visible pollution. On the other hand our highly sophisticated chemical, metallurgical and power generating industries as well as motor vehicle population are all emitting large quantities of particulate as well as gaseous pollutants.

In order to combat these problems modern abatement technology must be used which unfortunately requires large capital investment and due to financial constraints and socio-economic realities, cannot be introduced over a short period, like for instance the "electricity for all" programme, which may take years to realise.

The Vaal Triangle in particular has been experiencing serious air pollution problems, in the form of poor visibility and smog formation during winter periods. Air pollution thus has become a very controversial topic with different sections of society feeling threatened in different ways. Members of the public feel that their environment is degraded and fear that they and their children may suffer ill health.

Industrialists fear that stringent air pollution controls would harm or ruin industries which they are proud to have built up. Local authorities are caught in-between their ratepayers and the industries which are both vital components of the community. It is clear that this complex problem should be tackled in a rational and objective manner.

For these reasons it is important that in the planning for the future the following aspects regarding the area should be taken into account:

- 1) The Vaal Triangle is already one of the areas in the country with the highest concentration of heavy industries with many expansions still in progress. Concomitant with industrial growth there is a rapid increase in the population and the number of motor vehicles.

Each additional industry adds directly or indirectly to the existing pollution burden, even with the most stringent control measures in force. This is unfortunately the price we have to pay for living in a highly industrialized area. Industrial growth, urbanization as well as a higher standard of living all contribute to the prevailing levels of air pollution in the Vaal Triangle.

- 2) The area also encompasses a number of large un-electrified residential towns, in which coal is extensively used. During the winter months these sources cause a pall of dense smoke to envelope vast areas of the Vaal Triangle. These towns are still expanding at an ever increasing rate, due to the continued urbanization of the black population. Many of the new residents do not even own proper stoves and have to make use of open fires. This is by far the largest source in the area, contributing close to 70% of the pollution burden, for which no simple, quick solution exists.
- 3) The Vaal Triangle is also in an unfavourable situation as far as topographical and meteorological factors are concerned. During the winter months the area is subjected to strong temperature inversions. This phenomenon causes all smoke released at low level to remain trapped and to concentrate in the area. The Vaal Triangle is also situated at a lower altitude than the Witwatersrand, which results in smoke from Johannesburg and surroundings to drain into the Vaal basin under the influence of the so-called catabatic flow regime, aggravating the already bad conditions.

## TOEKOMSBLIK

### SENTRALE GEÏNTEGREERDE OMGEWINGSBESTUURSTELSEL

Die presidentsraadsverslag oor omgewingsbeheer in die RSA het 'n aantal ingrypende aanbevelings gedoen oor 'n nuwe oorhoofse struktuur en wetgewing om omgewingsbestuur in die RSA op 'n meer geordende basis te plaas. Die implementering van hierdie aanbevelings is sekerlik die mees belangrike stap vir die toekoms. Ongelukkig is daar nog nie inligting beskikbaar oor hoe dit toegepas gaan word nie en alle stappe wat in hierdie lesing genoem sal word, is soos dit onder die huidige bedeling gesien word:

Die belangrikste aanbevelings hier ter sprake is die versterking en uitbreiding van die Departement van Omgewingsake en dat hierdie departement 'n Geïntegreerde Omgewingsbestuurstelsel (GOB) moet

ontwikkel en instel. Uitvoerende funksies soos water- en lugbesoedelingbeheer wat tans onder ander departemente resorteer, moet by Omgewingsake geplaas word. Hierdie departement sal ook verantwoordelik wees vir oorhoofse beleidsbepaling terwyl die toepassing afgewentel word na streeks- of plaaslike vlak. Meer kundiges moet op streeksvlak aangestel word om in 'n raadgewende hoedanigheid tot die uitvoerende owerhede te dien.

Die aanbevelings is deur die Kabinet oorweeg wat die Departement van Omgewingsake die taak opgedra het om 'n witskrif oor die hele saak op te stel, met in agname van alle tersaaklike aspekte. Dit presies waarmee daardie departement tans besig is en daar word beplan om 'n diepgaande ondersoek te laat doen deur 'n konsultant wat werkgroepe sal gebruik om oor die verskillende aspekte aanbevelings te doen vir gebruik in die witskrif.

Die witskrif sal vir algemene kennisname en kommentaar vrygestel word waarna dit in wetgewing vasgelê sal word. Dit is belangrik dat die witskrif deeglik deur almal bestudeer word en dat kommentaar daarvoor ingedien word.

#### **AIR POLLUTION POLICY FOR THE FUTURE**

Our air pollution control policy is currently based on the principles of "Best Practicable Means" (BPM) which requires pollution to be reduced to a minimum in the first place and to render harmless any residual pollution that cannot be practically prevented. It takes into account control technology, financial implications, the current knowledge of the effect of pollutants, local conditions and specific pollutants in the vicinity.

Alternative options to BPM are:

- A. "Best available technology not entailing excessive cost" (BATNEEC). This approach is very similar to BPM.
- B. "Best practicable environmental option" (BPEO): This concept is also very similar to BPM, but where BPM is said not to take into account the effects of a pollutant on the total environment, this approach emphasises the protection of the environment across air, land and water.
- C. Air Quality Standards (AQS): Even in the USA where this approach was developed, there is a move away from this rigid standards approach to the more practical approach of BATNEEC.

As pollution control developed over the years in this country, BPM has been adapted to take into consideration the total environment although it is not defined as such in the Act. In applying BPM, guidelines were developed which also take into account the principles of AQS, current available technology and ambient standards. Many authorities in this field still believe BPM to be the best

policy for a developing country like the RSA, but that the term be renamed to BPEO instead, to be in line with modern thinking. However this matter will certainly be addressed in the white paper.

#### **SKAKELING MET DIE PUBLIEK**

In die verlede is kritiek uitgespreek teenoor die gebrek aan publieke deelname en inspraak in die beheer van lugbesoedeling. In hierdie verband is verskeie aksiekomitees op inisiatief van hierdie Direkoraat gestig ten einde skakeling tussen die owerhede, nywerhede, die media en die publiek moontlik te maak. Behalwe vir die lou ontvangs van die openbare pers, bestaan daar groot belangstelling in die aksies van die komitees. Daar word gepoog om hierdie forums te gebruik om kommunikasie en interaksie tussen die verskillende belangegroepe te bevorder. Hierdie metode kan suksesvol aangewend word om ook die eise van drukgroepe te akkommodeer en te temper. So het die Vaaldriehoek se Aksiegroep besluit om nouer saam te werk met Vaalgro, 'n organisasie wat ten doel het om ontwikkeling in die Vaaldriehoek te bevorder terwyl ekologiese oorwegings as van groot belang geag word. Hierdie tipe skakeling sal landwyd deur die Direkoraat ondersteun en bevorder word.

#### **TOEKOMSTIGE ROOKBEHEER IN WOONGEBIEDE**

In gebiede waar daar reeds rookbeheerstreeksbevele van toepassing is en waar daar hoofsaaklik van elektrisiteit as energiebron gebruik gemaak word, sal die plaaslike owerhede voortgaan om die goeie werk tot hede, voort te sit en die maatreëls suksesvol toe te pas.

In gebiede waar elektrisiteit nie vryelik beskikbaar is nie, sal daar in 'n groot mate staat gemaak word op die beskikbaarstelling van bekostigbare elektrisiteit. Die aanpassing van retikulasie-standaarde, met inagname van veiligheid vir verbruikers, kan elektrisiteit binne die bereik van meer huishoudings plaas.

Die installering van die voorafbetaalstelsel kan in hierdie gebiede groot verligting bring ten opsigte van die vervanging van ondoeltreffende rookbronne met elektriese toerusting.

Dit is noodsaaklik dat alle betrokke owerhede reeds in die beplanningsfase van alle woongebiede voorsiening sal maak vir die beskikbaarstelling van elektrisiteit aangesien latere installasie heelwat meer koste sal meebring. Daar bestaan geen twyfel meer oor die feit dat elektrisiteit in die langtermyn die enigste oplossing bied vir die energie-behoefte in alle woongebiede.

#### **VOERTUIE**

Ten einde beter beheer van dieselvoertuie deur plaaslike owerhede te verkry moet daar sekere wysigings aan die wetgewing aangebring word. Daar bestaan rede om te glo

dat dit meer bevorderlik sal wees indien dieselrookbeheer oorgedra word na die onderskeie verkeersowerhede deur dit in hulle verkeerswetgewing op te neem. Regulasies kragtens genoemde wetgewing kan verkeersbeamptes dan magtig om deur visuele waarnemings te oordeel of 'n voertuig na 'n toetsentrum moet gaan vir toetsing.

Met betrekking tot petrolaangedrewe voertuie, bestaan daar reeds 'n program vir die beskikbaarstelling van loodvrye brandstof in 1995. Soos voertuie met enjins geskik om loodvrye brandstof te gebruik, beskikbaar kom, sal daar 'n afname wees in die aanvraag na loodbevattende brandstof. Alhoewel onlangse bevindings nie dui op enige gesondheidsgevaar as gevolg van lood in petrol nie, sal dit enige latere probleme voorkom en sal die toekomstige gebruik van kataliste om fotochemiese rookmis te beheer, vergemaklik word.

#### **NYWERHEDE**

Ten einde te voorkom dat die besoedelingbydrae vanaf nywerhede in die gebied verder toeneem, sal in die toekoms groter klem gelê word op die optimale bedryf en instandhouding van beheertoerusting. Die huidige vereiste dat beheertoerusting vir 96% van die tyd teen ontwerpdoeltreffendheid bedryf moet word, kan moontlik strenger gemaak word indien toestande dit vereis. Oorskrydings van perke sal slegs in uitsonderlike gevalle toegelaat word en wetlike stappe sal teen oortreders geneem word. In hierdie verband is bystandstoerusting reeds van sommige groot nywerhede vereis en daar sal toenemend van nywerhede verwag word om deurlopend uitlate te monitor en verslag aan die Direkoraat te doen. Die instelling van 'n besoedelingsindeks vir nywerhede om hulself te monitor, geniet reeds vir 'n geruime tyd aandag en sal uitgebrei word.

In ooreenstemming met die beleid van beste beskikbare metode sal riglyne, soos in die verlede, deurlopend in konsultasie met die nywerheid aangepas word om strenger beheer te verseker en sodoende die bestaande probleme aan te spreek.

#### **AANWENDING VAN NAVORSING EN METINGSRESULTATE**

##### **Die Vaaldriehoekse Gesondheidstudie**

Die voorlopige bevindings van die Gesondheidstudie in die Vaaldriehoek dui op 'n onaanvaarbare hoë vlak van vastestof-besoedeling in die gebied. Stappe om rook-besoedeling en die vrylating van vastestowwe by nywerhede te verminder sal dus dringend aandag moet kry en kan aanleiding gee tot strenger beheer van vastestof uitlate.

Die gasagtige besoedelingsvlakke in die gebied is hoog maar nog binne aanvaarbare internasionale standaarde. Die beheer van spesifieke gasse soos SO<sub>2</sub> en koolwaterstowwe sal ernstig ondersoek moet word veral met die oog op die verbetering in sigbaarheid.

##### **Bron-identifikasie Studie**

Resultate van die navorsingsprojek wat gesamentlik deur Mintek en Wits gedoen word om te bepaal wat die bydrae is van die verskillende bronne tot die besoedelingslas in die Vaaldriehoek, sal binnekort beskikbaar kom. Hierdie inligting sal nuttig gebruik kan word om op 'n wetenskaplike basis te besluit oor vereistes ten opsigte van beheer by alle nywerhede en ander bronne in die gebied.

#### **CONCLUSION**

The RSA is on the verge of far-reaching changes in its environmental legislation and management system. Although it is too early to say exactly how and when the changes will be brought about, it is firmly believed that, based on the President Council's recommendations, a better system can be expected in the future. It is however important that the new system be introduced as soon as possible and that the amendments to the Act, which were drafted three years ago, be promulgated without further delay.

As far as the Vaal Triangle is concerned, plans for the future should include methods to address the single most urgent problem of high levels of particulate matter and the poor visibility by reducing smoke from residential areas and industrial activities as was discussed above.