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8 September 2006

The Director-General  
Department of Environmental Affairs and Tourism  
Private Bag X447  
Pretoria  
0001

Dear Sir/Madam

**GN NO. 528 GG NO. 28899 9 JUNE 2006 IDENTIFICATION OF SUBSTANCES IN AMBIENT AIR AND ESTABLISHMENT OF NATIONAL STANDARDS FOR THE PERMISSIBLE AMOUNT OR CONCENTRATION OF EACH SUBSTANCE IN AMBIENT AIR**

We wish to comment on the aforementioned government notice.

We wish to acknowledge that these proposed ambient air standards are a big accomplishment, and take us in the right direction towards more effective and efficient air quality management.

In the first instance, we are concerned that the South African values are given in the units  $\text{mg}/\text{m}^3$  or  $\mu\text{g}/\text{m}^3$  while the units ppb and ppm are used elsewhere e.g. in the results from the monitoring stations in Durban.. We propose that all the values that are given should be given as values in both  $\text{mg}/\text{m}^3$  or  $\mu\text{g}/\text{m}^3$  as well as ppm or ppb in order that they can be compared without ambiguity to other international standards. For example, the WHO value of  $500 \mu\text{g}/\text{m}^3$  for  $\text{SO}_2$  is by WHO translated to 175 ppb because  $0^\circ \text{C}$  is used as reference, while a  $25^\circ \text{C}$  reference gives what is used in Durban as 191 ppb. Until these values are presented unambiguously in all units it is impossible to make a fair comment and judgement.

Secondly we are concerned that, with the omission of the following hazardous chemicals, the list of substances considered for ambient air and the establishment of national standards is not sufficient to meaningfully protect public health:

### **Mercury**

The establishment of a mercury ambient standard to protect public health is crucial in the context of South Africa's developing economy and expanding need for energy from coal fired power stations. The bioaccumulation of mercury in the food chain is extremely harmful to not only people living in the area of mercury emission sources but to the entire population. Mercury is very persistent in the environment, bioaccumulates and continues to be emitted without regulation from industrial sources. For these reasons the reduction of mercury and the need for ambient air standards is fundamental. New Zealand have promulgated an annual average standard of 0.33ug/m<sup>3</sup>.

### **Particulate matter of the size 2.5ug (PM<sub>2.5</sub>)**

There is no proposed standard for PM<sub>2.5</sub>, the smallest particles of emissions and impurities which can penetrate the deepest into the lungs, comprised of the finer particles of dust and heavy metals, and, which are shown in the scientific literature to contribute more to adverse health effects than the larger PM<sub>10</sub> particles. The US EPA standard for PM<sub>2.5</sub> is 15ug/m<sup>3</sup> as a yearly mean, and 65ug/m<sup>3</sup> over 24 hours and the WHO Guideline for PM<sub>2.5</sub> is 10 µg/m<sup>3</sup> annual mean, and 25 µg/m<sup>3</sup> for the 24-hour mean. In this regard we recommend that the more stringent WHO standard be adopted and included in the South African standards forthwith and reviewed at later stage.

### **Benzene**

Benzene does not have the full array of associated time limitations, i.e. benzene is only shown with an annual average. We believe that there should be an additional short term exposure standard in line with the most current toxicology data that shows health effects might occur above these levels. The toxicity of Benzene is well known and is summarised in the table 1 below<sup>1,2</sup>.

Table 1 Toxicity of Benzene

Concentration	Clinical effects
1-5 ppm	Odour threshold in air
25 ppm	No clinical effects after 8 h
50-150 ppm	Headache, lethargy and weakness after 5 h
500-1,500 ppm	Serious symptoms after 60 min
7,500 ppm	Dangerous symptoms after 30 min
>20,000 ppm	Fatal after 5-10 min

Thirdly we are concerned that for some chemicals the proposed permissible amounts are insufficiently protective of health and refer in this regard to the World Health Organisation air quality guidelines Global Update 2005.

### **Carbon Monoxide**

Carbon Monoxide does not have the full array of associated time limitations and the values are presented differently from the WHO standard. We proposed that the DEAT adopt the WHO standard for this chemical and include a 15min and 30min standard.

WHO		DEAT	
value	time	value	time
90ppm	15min		
50ppm	30min		
25ppm	1hr	30mg/m <sup>3</sup>	1hr
10ppm	8hrs	10mg/m <sup>3</sup>	8hrs

### **Sulphur dioxide**

The South African proposed permissible concentration for the 24 hour maximum is 125ug/m<sup>3</sup> whereas the 24 hour mean for the WHO standard is 20ug/m<sup>3</sup>.

### **Particulate matter of the size 10ug (PM10)**

The South African proposed permissible concentration for the 24 hour maximum is 75ug/m<sup>3</sup> whereas the 24 hour mean for the UK standard is 50ug/m<sup>3</sup>.

The South African proposed permissible concentration for the yearly maximum is 40ug/m<sup>3</sup> compared with the yearly maximum for the state of California of 20ug/m<sup>3</sup>.

### **Ozone**

The WHO recommends that the air quality guideline for ozone be set at the level of 100ug/m<sup>3</sup> (0.06ppm) for daily maximum 8 hour mean. The South African proposed air quality guidelines contain a permissible amount of 120ug/m<sup>3</sup>. We propose that the South African guideline be amended in line with the WHO standard.

### **Other toxic chemicals**

Furthermore we proposed that the DEAT expand the list of standards for toxic chemicals and include (in the first instance) 1,3 Butadiene, Vinyl Chloride, Hydrogen Sulphide, EDC, MTBE and the rest of the BTEX suite in addition to Benzene (Toluene, Ethylbenzene and Xylene) ) to standards applicable for all the priority hot spots identified by the DEAT in South Africa. Groundwork and various other community organisations have undertaken grab sampling in

Sasolburg, Secunda, Vereeniging, Richards Bay, Pietermaritzburg, South Durban and Cape Town using the bucket brigade and have detected some of these in consistently significant quantities.

In addition, other chemicals identified by the South Durban Health Study, such as Vanadium and Manganese and semi-volatile organic compounds (SVOCs), including dioxins, furans, and polycyclic aromatic hydrocarbons should be added to the list.

We do not understand why less stringent standards than those applied internationally have been proposed. As no justification has been given for the lower standards, we feel that they should be adjusted to be in line with current international standards, as published by the WHO. We feel that in so doing health will be better protected, and section 24 of the Constitution “Everyone has the right to an environment that is not harmful to their health or wellbeing” will be more closely complied to. Unless DEAT can justify why South African citizens should be subject to the adoption of standards which are less rigorous than those set by the WHO, we believe it to be negligent in its duty to its citizens.

## **Implementation**

In order to implement and enforce the ambient standards, a system of monitoring has to be established and data generated. First, a network of stationary ambient monitoring stations needs to be established that will monitor for all of the parameters included in the program. The second phase requires that mobile monitoring equipment be made available in order to monitor for the chemicals that have short term criteria (10 min., 1 hour, 8 hour and 24 hour criteria).

With the exception of ozone and CO, all of the substances have annual standards. Thus the need to generate data from a network of stationary monitoring stations. This data will be accumulated over a year period. The frequency of the monitoring needs to be established in order to establish enforceable measuring procedures in order to enforce the standards. In the United States, air samples are collected once every 6 days for a 24 hour period as the data used to calculate the annual average.

The implementation of the shorter monitoring time standards can be more quickly implemented and enforced through the use of mobile monitoring efforts.

The standards, once established cannot be exceeded without resulting in enforcement. If an annual standard is exceeded the potential sources must be immediately identified as potential sources that have caused or contributed to the annual standard being exceeded. Then government must take immediate action or require the facility or facilities to implement reduction programs. Frequently as the monitoring data comes it will be averaged, if it becomes obvious that the annual standard will be exceeded then government can act before the entire annual data is available and target the potential sources of the emissions.

The shorter term limits should be enforceable with a single exceedence.

It is important that all of the monitoring data also be publicly available. Then the environmental organizations and communities affected can monitor the exceedences of the standards and watch

the progression of the annual data. Civil society can then insist that enforcement and proper reduction requirements are enacted immediately.

Any exceedence of the standard should be immediately transmitted to the public so that appropriate action can be taken.

### **Public participation**

We are concerned that government has not been proactive in involving all grass root civil society organisations in this standards-setting process. Many grass roots organisations who live in air pollution priority areas that we have communicated with feel that they have been sidelined and that there has been no attempt by the DEAT to explain and workshop these standards with them. The public participation process has therefore in this instance has been flawed, and government should follow its own guidelines to ensure good participation by the public.

Yours Sincerely,

S. (Bobby) Peek  
Director  
groundWork

List of organisations supporting this submission:

1. African Genesis Heritage Club
2. Boipatong Environmental Working Group
3. Friends of Steel Valley
4. Group for Environmental Monitoring
5. Sasolburg Air Quality Monitoring Committee
6. South Durban Community Environmental Alliance
7. Tableview Residents Association
8. Vaal Environmental Justice Alliance
9. Voice of the Voiceless – Secunda

### **References**

1. Clayton GD & Clayton FE (ed). Patty's Industrial hygiene and toxicology, 4th ed. John Wiley & Sons, Inc. New York, 1994
2. International Programme on Chemical Safety. Environmental Health Criteria 150: Benzene. WHO, Geneva, 1993
3. World Health Organisations WHO air quality guidelines global update 2005: Report on a working group meeting, Bonn, Germany, 18-20 October 2005