Centre *for* Environmental Rights
Advancing Environmental Rights in South Africa

The Honourable Minister Edna Molewa
Minister of Environmental Affairs
By email: GRamutshila@environment.gov.za

Cc: Dr Thuli Mdluli
National Air Quality Officer
By email: tnmdluli@environment.gov.za

Cc: Bev Terry
National Association for Clean Air
By email: bev@naca.org.za

CER/MF/RH/SK
16 October 2015

Dear Minister Molewa

REQUEST FOR REVIEW AND STRENGHENING OF THE NATIONAL DUST CONTROL REGULATIONS

Introduction

1. We address you on behalf of a group of non-government and community organisations concerned about poor air quality caused by the prevalence of dust – from multiple sources - in their respective areas. These organisations include:
    1.1. groundwork (gW);
    1.2. Earthlife Africa Johannesburg (ELA);
    1.3. the Federation for a Sustainable Environment;
    1.4. the Highveld Environmental Justice Network (HEJN) - comprising 14 community-based organisations;[1]
    1.5. the South Durban Community Environmental Alliance (SDCEA);
    1.6. the Vaal Environmental Justice Alliance (VEJA), and
    1.7. mining-affected communities in Riverlea, Johannesburg, including members of the Mining and Environmental Justice Community Network (MEJCON) ("our clients").

2. Our clients are particularly concerned about the ineffectiveness of the existing National Dust Control Regulations[2] ("Dust Control Regulations") in dealing with and alleviating the fugitive dust emissions that are pervasive in mining and industrial areas relatively close to residential homes. As you know, fugitive dust has serious health

[1] Includes as affiliates the Movement Environmental Defence; Earthnogenesis; Greater Middleburg Residents Association; Guqa Environmental Community Service; Mpumalanga Youth Against Climate Change; Outrageous Courage Youth; Ekurhuleni Environmental Organisation; SANCO Tokologo; SANCO Emalahleni; Khutala Environmental Care; Schoongesicht Residents Committee; Caroline Environmental Crisis Committee; Guide the People and Wonderfontein Resettlement Forum.

[2] GG 36974 GN 827 of 1 November 2013

2nd Floor, Springtime Studios,
1 Scott Road, Observatory, 7925
Cape Town, South Africa
Tel 021 447 1647, Fax 086 730 9098
Email info@cer.org.za, www.cer.org.za

implications for affected communities, particularly for children. These adverse health implications are exacerbated in communities living in informal housing with limited access to clean water.

3. Our clients' attempts to use the Dust Control Regulations – which have been in force since November 2013 – have proved futile. This is in part due to the fact that these regulations provide for a 30 day monitoring average, which makes it difficult to quantify dust and fugitive emissions occurring at high concentrations during discrete intervals. Notwithstanding significant and harmful levels of dust, dust monitoring reports obtained for various industries have shown that the dust readings regularly fall within the acceptable dust-fall rates, making it difficult to challenge non-compliance with the Regulations. This raises questions as to the validity of the monitoring method, whether the limit values included in the Regulations are protective of human health, as is required by the objects of the National Environmental Management: Air Quality Act (Air Quality Act),[3] and whether these Regulations are capable of effective enforcement.

4. The purpose of this letter is therefore to request that the Dust Control Regulations be reviewed and amended to make these more effective.

5. Below, we summarise the main concerns with the existing regulations. Thereafter, drawing from experiences in the United States of America (U.S.), we make specific recommendations for the improvement of the Dust Control Regulations.

6. We also draw to your attention that we are not the only organisations concerned about the adequacy of the Dust Control Regulations. The National Association for Clean Air recently convened a meeting in Cape Town to discuss implementation problems of the Regulations in August 2015. Below is our summary of the comments of experts at that meeting:

    6.1. it was acknowledged that dust monitoring is important and useful in air quality monitoring;
    6.2. the methods provided by the Dust Control Regulations are intended to be used as an indicator to ascertain if there is a dust problem;
    6.3. the dust bucket system was found not be effective for dust monitoring;
    6.4. The monitoring method is not adequate for determining the human exposure to and health impacts of dust;
    6.5. dustfall monitoring does not provide a surrogate for monitoring of PM standards;
    6.6. the ASTM D1739 method produces highly variable results, has not been or cannot be calibrated against a reference method for measuring dust deposition and does not or has not been demonstrated to have a statistically robust correlation with dust deposition on soils or other surfaces;
    6.7. data collected by industry over the years is a useful and cost effective method of providing trend analysis of dust deposition and an indication of main areas of dust generation, but has very little use;
    6.8. data are not comparable with dispersion modelling results and not very accurate for purposes of air quality monitoring; and
    6.9. it is unclear whether the Dust Control Regulations are appropriate to protect environmental rights.

7. At this meeting, there was no consensus reached on the most effective solution to resolve the dust monitoring problem.

[3] Section 2 of the Air Quality Act 39 of 2004

Background

8. As the Department is aware, the impact of dust on poor ambient air quality is significant. For example, the Highveld Priority Area Air Quality Management Plan (HPA-AQMP) outlines, in the table below, the total emissions of PM10 emissions from different sources in the HPA.[4]

Table 5: Total emission of PM_{10}, NO_x and SO_2 from the different source types on the HPA (in tons per annum), and the percentage contribution for each source category

	PM10		NO_x		SO_2	
Source category	**t/a**	**%**	**t/a**	**%**	**t/a**	**%**
Ekurhuleni MM Industrial (incl Kelvin)	8 909	3	15 636	2	25,772	2
Mpumalanga Industrial	684	0	590	0	5,941	0
Clay Brick Manufacturing	9 708	3	-		9,963	1
Power Generation	34 373	12	716 719	73	1 337 521	82
Primary Metallurgical	46 805	17	4 416	0	39 582	2
Secondary Metallurgical	3 060	1	229	0	3 223	0
Petrochemical	8 246	3	148 434	15	190 172	12
Mine Haul Roads	135 766	49	-		-	
Motor vehicles	5 402	2	83 607	9	10 059	1
Household Fuel Burning	17 239	6	5 600	1	11 422	1
Biomass Burning	9 438	3	3 550	0	-	
TOTAL HPA	**279 630**	**100**	**978 781**	**100**	**1 633 655**	**101**

NB. SO_2 percentage contributions aggregate is greater than 100 due to rounding of numbers.

Note that PM10 fugitive emissions from mine haul roads constitute 49% of total annual PM10 emissions in the HPA. The effective regulation and control of fugitive PM_{10} emissions is therefore essential for attainment of compliance with PM_{10} ambient air quality standards in the HPA.

9. It is clear that emissions from mine haul roads are dust related. Other fugitive dust (PM_{10}) related emissions include mining, industrial and agricultural activities such as blasting, mine overburden stripping, quarrying, ore and overburden handling; crushing and screening of ore, wind entrainment from mine stockpiles,[5] agricultural dust[6], stone crushing[7] and clay brick ovens.[8]

10. The main problem identified by our clients - as mentioned above - is that the Dust Control Regulations provide only a single tool – a Dustfall Standard containing a maximum dustfall rate (averaged only over 30-days) – for controlling dust emissions, in circumstances where the problem requires a far greater variety of tools that are appropriate to different situations.

11. Too much of the regulation is dependent on demonstrating that a polluter is violating "acceptable dustfall rates"- per the method identified in regulation 3 of the Dust Control Regulations. For example, the obligation for a polluter to develop and submit a dust management plan depends on demonstrating that a polluter is violating "acceptable dustfall rates" under Table 1, regulation 3(1).[9] Similarly, an obligation for a polluter to undertake ambient air quality monitoring for PM_{10} also depends on demonstrating that a polluter is violating "acceptable dustfall rates" under regulation 3.[10]

12. However, demonstrating that a polluter is violating "acceptable dustfall rates" under regulation 3 might take a considerable amount of time - three months at the very least and possibly one year. First, per the method

[4] HPA AQMP p19
[5] HPA AQMP p23
[6] HPA AQMP p38
[7] HPA AQMP p147
[8] Clay brick oven PM10 emissions are mainly due to using solid fuels under very poor combustion conditions.
[9] Regulation 6
[10] Regulation 7

identified in regulation 3, measuring a dustfall rate requires a 30-day averaging period, and a demonstration that there are two months (not consecutive) per year in which "acceptable dustfall rates" are exceeded. In addition, the regulation is exceptionally lenient in that the "permitted frequency of exceeding dust fall rate" is defined as "two within a year" (Table 1 of the Regulations), and that demonstrated exceedance of the standard in the first instance merely requires the implementation of a dustfall monitoring programme and the subsequent submission of a report. This, we submit, is an unacceptable duration to have to wait to decide whether a polluter needs to develop and submit a dust management plan to control fugitive dust emissions. Dust control measures may only be instituted three months after submission of the dust monitoring report. This is an unacceptable duration, particularly where impacts from dust are significant.

13. The Dust Control Regulations regulate "dustfall" which is defined as the deposition of dust.[11] Regulation 3 recognises the American Standard for Testing and Materials method (ASTM) D1739: 1970 as the standard test method for determining the location of sampling points and the collection and measurement of dust fall. However ASTM D1739: 1970, although a standard issued by a US agency (ASTM), revised and amended in 1998 and reapproved in 2004, is not actually used in the US as a standard method for the control of fugitive emissions of PM_{10}. The ASTM website describes ASTM D1739 as follows:[12]

"*Significance and Use*

This test method has the advantage of extreme simplicity. It is a crude and non-specific test method, but it is useful in the study of long-term trends. It requires very little investment in equipment and can be carried out without a large technically-skilled staff.

This test method is useful for obtaining samples of settleable particulate matter for further chemical analysis.

1. Scope

1.1 This test method covers a procedure for collection of dustfall and its measurement. This test method is not appropriate for determination of the dustfall rate in small areas affected by specific sources."

14. Thus, according to ASTM, D1739 paragraph 1 provides that it is a crude and non-specific test method, but it is useful in the study of long-term trends and it *is not appropriate for the determination of the dustfall rate in small areas affected by specific sources*. Yet the Dust Control Regulations use ASTM D1739 to determine if an activity gives rise to dust in quantities and concentrations that may exceed the dustfall standard. In other words, the Dust Control Regulations inappropriately use the D1739 method and apparatus to determine if a specific source is responsible for dustfall that exceeds the specified standard. In the circumstances, it is submitted that the DEA should do away with the ASTM D1739 method and apparatus as the method used to measure dustfall rate, and that more effective methods and apparatus as suggested below should replace these.

15. The Dust Control Regulations identify a measure that would much more quickly determine whether a polluter needs to develop and submit a dust management plan - ambient air quality monitoring for $PM_{10,}$ as provided for in regulation 7 - but relegate use of this method to instances for which there is already a demonstration that a polluter is violating "acceptable dustfall rates" under regulation 3.

16. Our clients are of the opinion that, in addition to requiring direct measurements of fugitive dust emissions through opacity measurements, the Dust Control Regulations would be more effective at achieving their purpose if the regulations were based on the Michigan and Utah approaches (and other suggestions set out below). These approaches are built on the premise that is all sources or potential sources should pro-actively adopt best practices for managing and controlling dust emissions. This would be more consistent with sections 2 and 28 of the NEMA principles adopting a risk averse approach and imposing a duty of care on any person who causes, has caused or

[11] Regulation 1

[12] http://www.astm.org/Standards/D1739.htm

who may cause significant dust pollution. PM10 and/or opacity monitoring should be used to monitor the effectiveness of dust control and management methods and compliance with an opacity /PM10 standard. No trigger should be required to institute dust control measures.

17. Below, by way of comparison, we evaluate the position in Michigan and Utah in the U.S.- states that also have significant dust problems as a result of mining and industrial activity.

Comparison with other Michigan and Utah Standards that provide for varied tools for controlling fugitive emissions

18. The Dust Control Regulations are rigid in the manner and approach of combatting fugitive emissions, and should provide for a variety of tools to be used for dust and fugitive emissions control from industrial sources.

19. In standards adopted in the States of Michigan[13] and Utah[14] in the US, regulations and measures rely not on a dustfall standard, but instead on the implementation of best practices e.g. watering unpaved roads, wetting of aggregate stockpiles, restrictions on vehicle speeds, planting vegetative covers, providing synthetic covers, enclosing conveyors and loading/unloading equipment etc. - the Michigan and Utah Standards are attached as **Annexures A** and **Annexure B**, respectively. Moreover, as a primary quantitative means of enforcement, the US standards rely, not on a maximum dustfall standard, but on an opacity standard.

20. For example, section 324.5524(2) of the Michigan Regulatory Requirements for Particulate Matter Generation provides that:

> "*except as provided in subsection (8), a person responsible for any fugitive dust source regulated under this section shall not cause or allow the emission of fugitive dust from any road, lot, or storage pile, including any material handling activity at a storage pile, that has an opacity greater than 5% as determined by reference test method 9d. Except as otherwise provided in subsection (8) or this section, a person shall not cause or allow the emission of fugitive dust from any other fugitive dust source that has an opacity greater than 20% as determined by test method 9d. The provisions of this subsection shall not apply to storage pile material handling activities when wind speeds are in excess of 25 miles per hour (40.2 kilometers per hour*)."[15]

21. In addition to meeting the opacity limits stated in section 324.5524(2), fugitive dust sources must also include specific dust suppression methods for certain source activities in their fugitive dust programmes as outlined in detail in section 324.5524(3).[16]

22. In addition, Section 336.1301 of the Michigan Air Pollution Control Rules provide:[17]

> *" (1) Except as provided in subrules (2), (3), and (4) of this rule, a person shall not cause or permit to be discharged into the outer air from a process or process equipment a visible emission of a density greater than the most stringent of the following:*
> *(a) A 6-minute average of 20% opacity, except for 1 6-minute average per hour of not more than 27% opacity.*
> *(b) A limit specified by an applicable federal new source performance standard.*
> *(c) A limit specified as a condition of a permit to install or permit to operate*."[18]

---

13 Managing Fugitive Dust: A Guide for Compliance with the Air Regulatory Requirements for Particulate Matter Generation dated 2014 available at http://www.michigan.gov/documents/deq/deq-ead-caap-genpub-FugDustMan_313656_7.pdf

14 R307-205-5 - Utah Standards for Fugitive Emissions and Fugitive Dust dated 2005 available at http://www.rules.utah.gov/publicat/codificationsegue.htm

15 p20

16 Sub-paragraph 3 provides very specific and detailed procedures to for controlling fugitive dust emissions in a manner that will result in compliance.

17 p26

18 Rule 301 p20

23. Chapter 4 of the Michigan Regulatory Requirements on determining opacity state that:

> "When fugitive dust rises into the air, it is measured by its level of opacity, or the level at which the dust reduces the transmission of light or obscures an observer's view. The greater the concentration of fugitive dust, the greater the opacity designation".

24. They describe the relatively simple methods for determining whether the outer air from a process or process equipment is a visible emission that has a density greater than 20% opacity.[19] These requirements are based on the US Environmental Protection Agency (EPA) standardised set of protocols or methods used to measure air opacity and fugitive dust.[20] Our clients submit that similar protocols should be adopted in South Africa to assist in measuring visible dust or other emissions where these are prevalent.

25. Additionally our clients are of the opinion that the Dust Control Regulations should require that a fugitive emissions management plan be included in the atmospheric emission licence (AEL) for listed activities that are likely to generate such emissions as stipulated in the Air Quality Act List of Activities.[21]

Analysis of dust from tailings storage facilities

26. Another concern raised by our clients is that the Dust Control Regulations do not require the geochemical analysis, including the chemical analysis and speciation required to determine the chemical toxicity, and radionuclide analysis to determine the radiological toxicity, of dust from tailings storage facilities. There is near certainty that significant health impacts are caused by the inhalation and ingestion of radioactive and toxic dust fallout from gold and uranium tailings dumps. By way of example, in terms of the West Rand District Municipality Environmental Management Framework of 2013, 42.24 tons of dust from mine tailings dumps are discharged into the West Rand environment per day. The National Nuclear Regulator published findings on the impacts of mining activities to the public in the Wonderfonteinspruit Catchment Area and found that significant radiation exposure can occur in the surroundings of mining legacies, due to:

    26.1. inhalation of Rn-222 daughter nuclides from radon emissions of desiccated water storage dams (e.g. Tudor dam and slimes dams);
    26.2. the inhalation of contaminated dust generated by wind erosion from these objects; and
    26.3. the contamination of agricultural crop (pasture, vegetables) by the deposition of radioactive dust particles, which can cause considerable dose contributions via ingestion. [22]

27. Our clients request that the Dust Regulations include a provision requiring periodic – at least annual - geochemical analysis of dust from tailings storage facilities and an annual report modelled on AEL reporting requirements. The annual report should also include reporting on the dust monitoring and management programme.

---

[19] p5

[20] U.S. EPA Rule 402 on Fugitive Dust Adopted in 1993 and amended in 1994, 1995, 2004 and recently in March 2015

[21] Regulation 20 of the List of Activities which result in atmospheric emissions which have or may have a significant detrimental effect on the environment, including health, social conditions, economic conditions, ecological conditions or cultural heritage GN 893 GG 37054

[22] TR-RRD-07-0006 Radiological Impacts of the Mining Activities to the Public in the Wonderfonteinspruit Catchment Area dated 12 July 2007

Conclusion

28. For the reasons set out above, our clients submit that the Dust Control Regulations are ineffective and defective in various respects, failing to meet their aim of controlling dust adequately. As a result, we are instructed to request that the regulations be urgently amended to make provision for:

    28.1. A more pro-active and cautionary approach that adopts best practices for managing and controlling dust emissions, and that requires a variety of tools to be utilised by industries to control dust and other fugitive emissions using best practice - similar to those outlined in section 324.5524 of the Michigan standards and in R307-205-5 of the Utah Standards for Fugitive Emissions and Fugitive Dust.

    28.2. an opacity standard and measurement protocol for visible emissions akin to that provided in chapter 4 of the Michigan Regulatory requirements, or in the U.S.EPA Visible Emissions Field Manual (**Annexure C**);
    28.3. a fugitive dust management standard similar to U.S. EPA Rule 402 (**Annexure D**);
    28.4. all applications for AELs required for listed activities in terms of the Air Quality Act to be accompanied by a fugitive emissions plan;
    28.5. periodic geochemical analyses, including the chemical analysis and speciation required to determine the chemical toxicity, and radionuclide analysis to determine the radiological toxicity of dust from tailing storage facilities to be submitted to the licensing authority; and

29. We trust that this provides a basis to consider the amendment of the Dust Control Regulations, and look forward to your confirmation that this matter will be prioritised in the Department's strategic plan for 2016-17.

30. Please let us know should you require any additional information regarding any aspect of these submissions. We, our clients and experts who have provided input into this submission are willing and able to work with the Department on a review of the Dust Control Regulations. Given the concerns of its members, we hope that NACA and its members will also be willing to assist.

Yours faithfully
CENTRE FOR ENVIRONMENTAL RIGHTS

per: 

Melissa Fourie
Executive Director
Direct email: mfourie@cer.org.za