

 environmental affairs Department: Environmental Affairs REPUBLIC OF SOUTH AFRICA		REQUEST FOR REVIEW AND STRENGTHENING OF THE NATIONAL DUST CONTROL REGULATIONS	
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REQUEST FOR REVIEW AND STRENGTHENING OF THE NATIONAL DUST CONTROL REGULATIONS

Centre for Environmental Rights has on the 16th October 2015 wrote a letter to the Minister (Own reference No. CER/MF/RH/SK), requesting the review of the National Dust Control Regulations (Government Gazette No. 36974; Regulations No.827, dated 01 November 2013). The department has analyzed this request and supporting reasons and/or motivation, and has provided its responses as tabulated below.

COMMENTS AND RESPONSE DATABASE

REF.	COMMENT	COMMENTATOR'S SUGGESTION	DEPT'S RESPONSE
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 Control Regulations are based on the adoption of acceptable levels of dust deposition rates on residential and non-residential areas. The associated measurements are therefore aimed at quantifying the

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	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 <u>dust readings regularly fall within the acceptable dust-fall rates, making it difficult to challenge non-compliance with the Regulations.</u>		dust deposition (dustfall) load/impact on the ambient environment. It is not intended to quantify the amount of fugitive dust emitted by a specific source thus cannot be used as suggested by the CER's concern. Furthermore, the period required to collect the dust sample sufficient to quantify the impact is determined by internationally accepted science (internationally accepted standard). The 30 days averaging period is a scientifically determined period that is used in qualifying the deposition rate, thus can stand the legal test. The prescribed limits provided in the regulations define the levels of dust acceptable in residential and non-residential areas thus define compliance criteria with respect to deposition rates. These limits were established by the local experts under an independent standards-setting process (SABS), informed by the

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	This raises questions as to the <u>validity of the monitoring method</u>, <u>whether the limit values included in the Regulations are protective of human health</u>, as is required by the objects of the National Environmental Management: Air Quality Act (Air Quality Act),¹ and <u>whether these Regulations are capable of effective enforcement</u>.		monitoring data collected over a period of about 20 years. It is unclear how CER defines industrial non-compliance outside these regulated limits. The monitoring method adopted for dust deposition is ASTM D1739, which is the simple, reliable and cost effective method capable of providing deposition data consistently. More details about the methods elaboration is provided in the responses below. The department maintains that the ASTM D1739 remains the appropriate and valid method for measurement of dust deposition. With respect to protection of human health, the department will like to remind CER that the national ambient air quality standards are the standards under the Act that defines the air that is not harmful to human

¹ Section 2 of the Air Quality Act 39 of 2004

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			health and wellbeing. Under these standards, fractions of thoracic and respirable particles are controlled. Dustfall concerns the dust particles that do not remain suspended for longer periods in the ambient environment, thus are considered to be have high nuisance characteristics, hence dust control regulations are primarily aimed at prevention of nuisance (see S.32 (b)). Notwithstanding this, the regulations acknowledges that exposure of humans to persistent, elevated levels of dust results in undesired health impacts (e.g. sinusitis responses) thus determines acceptable limit for residential areas, and furthermore calls for closer watch on the effect of these on the PM₁₀ concentrations. The department request CER to note the relationship between the dustfall limits and the PM standards prescribed under S.9 of the Act, while

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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: 1. it was acknowledged that dust monitoring is important and useful in air quality monitoring; 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; 3. the dust bucket system was found not be effective for dust monitoring; 4. The monitoring method is not adequate for determining the human exposure to		noting that the standards that define the quality of air that is not harmful to human health and wellbeing are the national ambient air quality (S.9) standards. As CER might be aware, this meeting was one of the many series of meetings of the scientific community (with involvement of various air quality officers) to make people aware of the regulations, and the challenges around the use of the 1970 version of the ASTM D1739 as opposed to the latest method (Revised ASTM D1739 of 1998/2004). It is therefore not appropriate that these engagements are painted as meetings to discuss problems of the Dust Control Regulations.

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	and health impacts of dust; 5. dustfall monitoring does not provide a surrogate for monitoring of PM standards; 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; 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; 8. data are not comparable with dispersion modelling results and not very accurate for purposes of air quality monitoring; and 9. it is unclear whether the Dust Control Regulations are appropriate to protect environmental rights.		

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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.		While dustfall standards forms the backbone of the regulations, they also provide for the dust management plan, detailing the measures for the control of dust, chosen by the polluter based on the best practicable environmental option principle. Furthermore, continuous monitoring of dust for significant activities is required, and reporting on the implementation of the measures. Furthermore, where elevated levels of dust exceeding the standards consistently is observed, the regulations provides for the monitoring of PM₁₀, to assess the impact of these levels on human health.
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		DEA confirms that the logic that the regulations follow is based on the potential exceedance of the dust fallout rates established and agreed to be acceptable levels of dust in different areas.

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	that a polluter is violating "acceptable dustfall rates" under Table 1, regulation 3(1).² Similarly, an obligation for a polluter to undertake ambient air quality monitoring for PM₁₀ also depends on demonstrating that a polluter is violating "acceptable dustfall rates" under regulation 3.³		While the basis of limits and generally the provisions of Section 32 focus on the nuisance factor, DEA link these limits with the risk to human health, thus provide that where exceedance of dust fallout rates is persistent, the ambient monitoring be conducted to confirm if elevated levels of dust does not have effect on ambient levels of PM₁₀. Ambient monitoring is a highly complex and costly exercise which can be required only when there is proof that an activity is the main source of elevated levels of dustfall thus a high risk activity to exceedences of ambient standards.
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 identified in regulation 3, measuring a	<u>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</u>	These regulations, as clarified above, provide a quantitative impact of dust deposition on ambient environment, where multiple activities contribute to overall dustfall. As a result, enough evidence to attribute a single source

² Regulation 6
Regulation 7

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	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.	three months after submission of the dust monitoring report. This is an unacceptable duration, particularly where impacts from dust are significant.	to exceedences must be gathered to stand the test of the courts. This process should be carried out in a scientifically credible and legally defensible manner, including taking into account seasonal variation, meteorology and the employment of acceptable measurement methods and principles. Furthermore, once the sources has been identified, a reasonable time for a source to identify measures (which includes consultation) for the control of dust to prevent dustfall episodes should be provided. This is in line with the principle of the Best Practical Environmental Option provided for under the National Environmental Management Act. A regulated period of 3 months to come up with a plan for dust control is reasonable and practical.
13	The Dust Control Regulations regulate "dustfall" which is defined as the deposition of		The regulations does not use ASTM D1739 for monitoring of PM ₁₀ either,

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	dust.⁴ 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, <u>is not actually used in the US as a standard method for the control of fugitive emissions of PM₁₀</u>. The ASTM website describes ASTM D1739 as follows:⁵ "Significance and Use <i>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.</i> <i>This test method is useful for obtaining</i>		but of dust, which includes particles with aerodynamic diameter up to 100 micron metres. Understanding of the what constitutes dust, and PM₁₀ (which accounts for a fraction of total dust), and how they are regulated under both the National Ambient Air Quality Standards and Dust fall Limits and their associated monitoring approaches must be established by CER.

⁴ Regulation 1

⁵ <http://www.astm.org/Standards/D1739.htm>

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	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.	ASTM D1739 is a useful tool in understanding the long term trends, and can also be used for the confirmation of source's contribution to the overall dust load. These is evidence of the effectiveness of this standard in identification of the sources of dust using this method, confirmed by the experts meeting that CER has referred to under paragraph 3 of their submission. South Africa is the only country that has a comprehensive data on using this method, which has proved to work for more than 20 years in the country. CER's recommendation to scrap off

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			the use of ASTM D1739 is without merit thus not accepted.
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 PM₁₀, 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.		Ambient air quality monitoring for PM₁₀ has been included in the regulation to ascertain that the dust does not result in exceedance of ambient air quality standards (which are the ONLY standards that define the quality of air that is not harmful to human health and wellbeing), in instances in which elevated levels of dust persists. The object of the regulation is not to redefine ambient air quality standards or to impose ambient monitoring for PM₁₀ but to control dust. CER's assumption that PM₁₀ monitoring is an appropriate tool to achieve the objects of the regulations is in itself inappropriate as it ignores the objects of the regulations, and attempts to use the ambient air quality standards tools in an irregular and scientifically flawed manner.

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16	Our clients are of the opinion that, in addition to requiring direct measurements of fugitive dust emissions through <u>opacity measurements</u>, 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 <u>all sources or potential sources should pro-actively adopt best practices for managing and controlling dust emissions</u>. 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 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. <u>No trigger should be required to institute dust control measures.</u>		<u>Opacity measurements</u> Opacity measurements focuses on visible emissions of a specific source, while dust fall monitoring is a measure of the dust deposition on the receiving environment. Opacity measurements are thus not in line with the intent of the regulations, which are to monitor the impact various ACTIVITIES (Not point sources) on the receiving environment, to satisfy the dust fall standards prescribed under Regulation 3. Furthermore, CER should take note of the limitation of the opacity method that it is recommending for use under South African legislation. US EPA Method 9 is a highly subjective method that is dependent on trained observers of plumes (smoke testers). This method is a human resource intensive, time dependent method that cannot provide a comprehensive account of compliance or non-

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		<u>All sources or potential sources should pro-actively adopt best practices for managing and controlling dust emissions (No trigger should be required to institute dust control measures).</u>	compliance thus cannot be used under regulations. Indeed the duty of care principle prescribed under NEMA already requires everyone to take into account potential environmental impacts associated with their activities, and demands that precautionary measures be taken to prevent environmental deterioration. This adherence on its own is not sufficient in some cases thus environmental regulations are put in place to focus on specific cases where comprehensive measures and tools are required to make the operator of the activity more accountable. This also applies to the dust pollution, where there is a need to regulate the generators of excessive dust. To qualify a source as a significant generator of dust requires a clear, scientifically sound and defensible criteria/trigger. The department thus do not support CER

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			statement that there should not be a trigger to institute dust fall monitoring, and that every dust generator must comply with the regulations. This recommendation, if adopted will result in severe undesired consequences (e.g. a person sweeping the yard, grave diggers etc. will have to monitor and report, develop and implement dust management plans or face huge penalties for non-compliances). This will make regulations impossible to implement by authorities.
17-25	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 1. The Dust Control Regulations are rigid in the manner and approach of		While DEA appreciates CER's effort in attempting to understand international best practice, the following points should be noted in line with the points put forth here by CER: (1 and 2): While Section 32 provides for the

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	combatting fugitive emissions, and should provide for a variety of tools to be used for dust and fugitive emissions control from industrial sources. 2. In standards adopted in the States of Michigan⁶ and Utah⁷ 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. <u>Moreover, as a primary quantitative means of enforcement, the US standards rely not on a maximum dustfall standard,</u>		prescription of the measures for the control of dust, this takes into account Best Practical Environmental Option principle, which calls for the regulators to take into cognizance the variability of mitigation and prevention measures that can be used to curb negative environmental impacts without compromising social or economic factors. The regulations are therefore not rigid but provides for generators of excessive dust to study their sources impacts and allow them to choose best abatement options that considers aspects of environmental protection, and social and economic implications of these choices. (2 – Opacity vs Dustfall Standards) While the CER analysis of the US standards clearly focuses on the visibility issues, the South African

⁶ 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

⁷ R307-205-5 - Utah Standards for Fugitive Emissions and Fugitive Dust dated 2005 available at <http://www.rules.utah.gov/publicat/codificationseque.htm>

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	<u>but on an opacity standard.</u> 3. For example, section 324.5524(2) of the Michigan Regulatory Requirements for Particulate Matter Generation provides that: <i>"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</i>		Dust Control Regulations focuses on the impact of dust fall on the receiving environment. As clarified above, the opacity measurements recommended are highly subjective to be used as the basis of the regulations. Dust fall approach is more favourable for reasons related to practicality, the effectiveness in providing us with the impact on the receiving environment. CER should note meeting opacity levels does not necessarily translate to acceptable deposition rates. As such, the two tools cannot be used together or interchangeably under the Dust Control Regulations.

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	excess of 25 miles per hour (40.2 kilometers per hour).⁸ 4. 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).⁹ 5. In addition, Section 336.1301 of the Michigan Air Pollution Control Rules provide:¹⁰ " (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,		(5 to 7 – Restrictions of dust from process/equipment) CER should note that, the South African Dust Control Regulations are applicable to areas, not specific sources. These are controlling impacts on the receiving environment (as implied under S32 (b) which provides for prescription of steps to prevent dust NUISANCE), not point sources. S.21 and S.23 Notices are

⁸ p20

⁹ Sub-paragraph 3

¹⁰ p26

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

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	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."¹¹ 6. 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". 7. They describe the relatively simple methods for determining whether the outer air from a process or process		the relevant tools for this purpose. Furthermore, PM₁₀ is a primary ambient air quality pollutant and is controlled under S.9 Notices.

¹¹ Rule 301 p20

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	equipment is a visible emission that has a density greater than 20% opacity.¹² 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.¹³ 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. 8. 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.¹⁴		(8 Fugitive emissions management plan) S.21 Notice, which is the primary tool that regulates listed activities, already provides for this, thus there is no benefit in including this clause under the regulations, which are aimed at regulating the impact of the dust deposition on areas but not point sources.

¹² p5

¹³ U.S. EPA Rule 402 on Fugitive Dust Adopted in 1993 and amended in 1994, 1995, 2004 and recently in March 2015

¹⁴ 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

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26-27	Analysis of dust from tailings storage facilities 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 Wonderfontein spruit Catchment Area and found that significant radiation exposure can occur in the surroundings of mining legacies, due to:		The Dust Control Regulations, published in terms of the Air Quality Act, have got limitations of the scope in line with the objects of the Act. CER clients recommends that the Minister goes beyond the mandate of the Act to address issues related to radioactivity etc. Furthermore, the object of the dust control regulations is to limit the dust deposition, taking into account the ambient air quality standards where specific fractions of particulate matter and heavy metals are controlled. The department does not support CER recommendation.

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	1. inhalation of Rn-222 daughter nuclides from radon emissions of desiccated water storage dams (e.g. Tudor dam and slimes dams); 2. the inhalation of contaminated dust generated by wind erosion from these objects; and 3. the contamination of agricultural crop (pasture, vegetables) by the deposition of radioactive dust particles, which can cause considerable dose contributions via ingestion.¹⁵ 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.		
	Conclusion		While the department notes CER's call for the revision of the Dust

¹⁵ TR-RRD-07-0006 Radiological Impacts of the Mining Activities to the Public in the Wonderfontein spruit Catchment Area dated 12 July 2007

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	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: 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. 2. an opacity standard and measurement protocol for visible emissions akin to that provided in		Control Regulations, the department is already in a process to review of the regulations purely on the aspect of updating the monitoring method used to the latest ASTM D1739. The department will use this process to critically listen to all stakeholders, including CER, taking into account the mandate of the Act, and the intended purpose of these regulations.

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	chapter 4 of the Michigan Regulatory requirements, or in the U.S.EPA Visible Emissions Field Manual (Annexure C); 3. a fugitive dust management standard similar to U.S. EPA Rule 402 (Annexure D); 4. all applications for AELs required for listed activities in terms of the Air Quality Act to be accompanied by a fugitive emissions plan; 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 2. 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		

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	plan for 2016-17. 3. 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.		