



**THE PRESIDENCY**

**REPUBLIC OF SOUTH AFRICA**



**SOCIO-ECONOMIC IMPACT ASSESSMENT SYSTEM (SEIAS)**  
**INITIAL IMPACT ASSESSMENT (PHASE 1)**  
**2019**

**THE INITIAL IMPACT ASSESSMENT OF THE PRIORITY AREA AIR QUALITY  
MANAGEMENT PLAN REGULATIONS**

## 1. The problem/ Theory of Change

### Background

There are three priority areas that were declared in terms of Section 18(1) of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) (NEM: AQA, herein referred as AQA). These areas are the Vaal Triangle Airshed Priority Area (VTAPA) which was declared on 21 April 2006, the Highveld Priority Area (HPA) which was declared on the 23 November 2007, and the Waterberg Bojanala Priority Area (WBPA) which was declared on the 15 June 2012. Figure 1 shows a map of the three air quality priority areas.



Figure 1. Location of the three national Priority Areas

The Minister (responsible for environment) declared the priority areas because she/he reasonably believes that national ambient air quality standards (NAAQS) is being or may be exceeded in the area and thus a specific air quality management interventions are required to address the situation. In all declared priority areas, particulate matter pollution is the main problem. Figure 2, 3 and 4 shows the annual trends of  $PM_{10}$  and  $PM_{2.5}$  in the three priority areas. It is evident from the levels have been above the standards for several years even after the AQMP were developed and implemented.

## PM<sub>10</sub> vs PM<sub>2.5</sub> - VTAPA

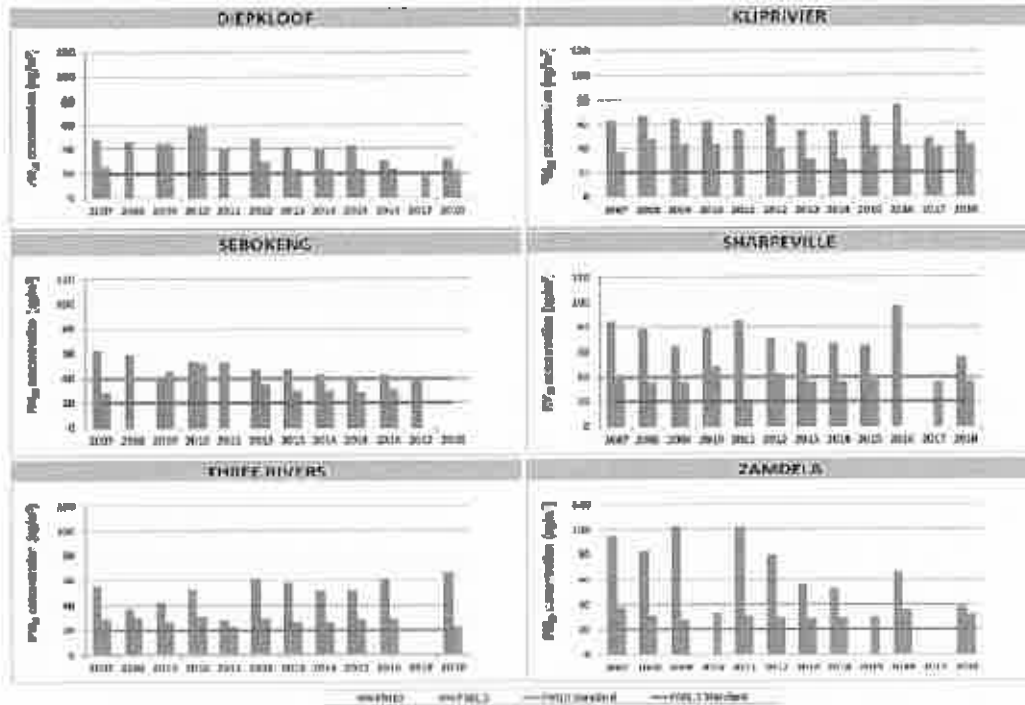


Figure 2: VTAPA annual PM<sub>10</sub> and PM<sub>2.5</sub> trends from 2007 to 2018

## PM<sub>10</sub> vs PM<sub>2.5</sub> - HPA

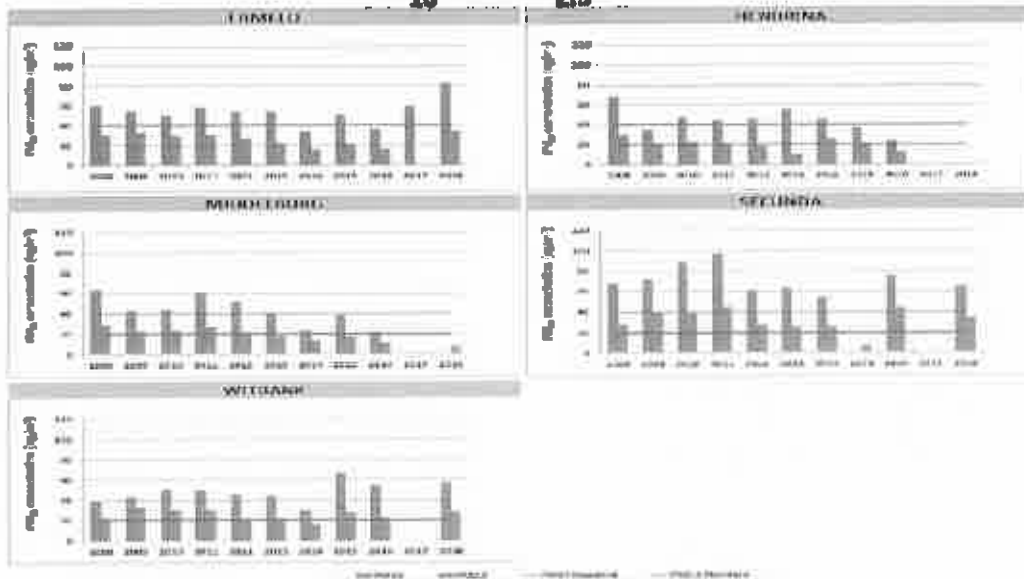


Figure 3: HPA annual PM10 and PM2.5 trends from 2007 to 2018

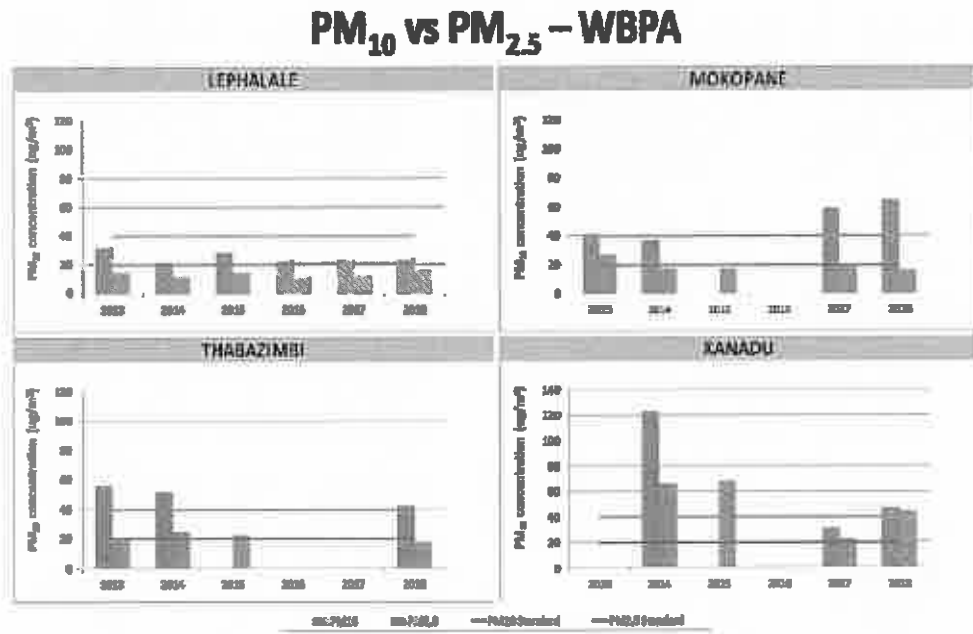


Figure 4: WBPA annual PM10 and PM2.5 trends from 2007 to 2018

Following the declaration, Air Quality Management Plan (AQMP) for priority areas were developed and published as follows: the VTAPA AQMP in May 2009, HPA in April 2012, and the WBPA in 2015. The priority area AQMPs are currently under implementation. According to the National Framework for Air Quality Management Planning in the Republic of South Africa, AQMP should be reviewed after five years. The AQMP midterm review was conducted in HPA and VTAPA, and the reports shows that even though some of the interventions were implemented, air quality in those areas remains poor, with numerous exceedances of the NAAQS. This was partly attributed to lack of accountability by major polluters.

The non-government organisation (NGO) such Centre for Environmental Rights (CER), groundWork, and the Highveld Environmental Justice Network, took the government (Minister of Environmental Affairs, the President, Member of Executive Council (MEC) responsible for environment in Gauteng and Mpumalanga provinces to court due to failure by government to ensure that ambient air quality in the HPA complies NAAQS. The NGOs further demanded that the department must develop regulations for enforcing the

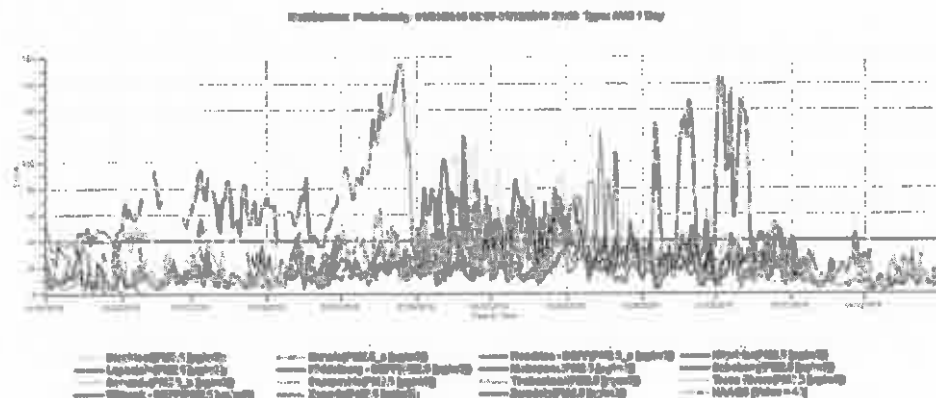
implementation of the priority areas AQMP. The Minister instructed the department to develop those regulations as a matter of urgency.

**Problem Statement**

The air quality in the priority areas does not meet the National Ambient Air Quality Standards (NAAQS) due to the ineffective implementation of the AQMPs. This problem has not been resolved even after the plans were developed and implemented to address it.

**1.1. What is the social or economic problem that you are trying to solve?**

The ambient air in the air quality priority area does not meet the National Ambient Air Quality Standards (NAAQS). The daily averages shows a more clearer picture on the daily  $PM_{2.5}$  and  $PM_{10}$  exceedances of the standards in the priority areas as shown in Figure 5 and 6. Exposure to PM has been associated with hospitalization for respiratory or cardiovascular diseases and exacerbation of respiratory diseases, such as asthma. The health effects depend on particle size and chemical composition. The health impact of  $PM_{2.5}$  are more pronounced because the smaller particles readily absorbed through the respiratory system.



**Figure 5: The ambient  $PM_{2.5}$  levels in the priority areas**

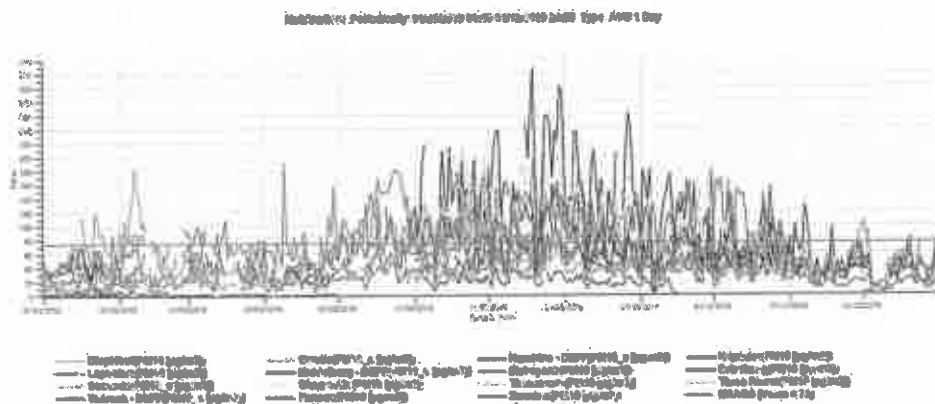


Figure 6: The ambient PM<sub>10</sub> levels in priority areas

**1.2. What are the main causes of the problem? That is why the problem arise and why does it persist?**

The main cause of the problem is lack enforcement measure to ensure accountability in the implementation of the AQMP. The AQMPs stipulate goals and activities that should be undertaken by the various stakeholders to reduce atmospheric emissions, thus ensuring compliance with standards in the priority areas. These stakeholders include government, communities, industries and mines. Industries are currently held accountable through the licensing system however, it is difficult to hold communities, government and mines accountable. Some of the AQMP interventions have been implemented, but due to lack enforcement mechanism and willingness by some of the parties, air quality in the priority areas is not improving. There is currently no punitive measures in place to hold all stakeholders responsible for their commitments.

Identified Problem	Main Causes of the Problem	Why does it persist as a problem?
The air quality in the area does not meet the National Air Quality Standards (NAAQS) due to the ineffective implementation of the AQMPs	Stakeholders other than industries cannot be held accountable for the AQMP commitments. There is no legal instrument to enforce the AQMP commitments	<ul style="list-style-type: none"> <li>Negative attitude by major polluters, as they don't consider AQMP as a legal document that can be enforced</li> <li>The cost of implementing the AQMP commitments might be high to some stakeholder</li> </ul>

		<ul style="list-style-type: none"> <li>• No punitive measures could be applied. The Regulation will provide guidance on the punitive measures</li> <li>• The service delivery in most municipalities is collapsing. The municipalities are unable to fulfil their commitments which among others include waste collection. In the absent of waste collection, residence resort to waste burning which contribute to air pollution.</li> </ul>
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### 1.3. Whose behaviours give rise to the problem, and why does that behaviour arise?

Remember that several groups including some in government may contribute to the identified problem. Their behaviour may arise amongst others because the current rules are inappropriate; because they gain economically from the behaviour; or because they are convinced that they are doing the right thing. Identifying behaviours that cause the problem should point to the behaviours that must be changed in order to achieve the desired solution.

Identified Problem	Behaviour giving rise to the identified problem	Groups whose behaviour give rise to the identified problem?	Why does the behaviour arise?
The air In the area does not meet the National Air Quality Standards due to the ineffective implementation of the AQMPs	Failure by the industry to reduce emissions	The Industrial Sector	<ul style="list-style-type: none"> <li>• Industries do not priories environmental compliance. They focus on profit.</li> <li>• The country is held ransom by the industry because of unemployment problems.</li> </ul>

	<b>Failure to manage dust emission from the Mines</b>	<b>Industry and Government</b>	<ul style="list-style-type: none"> <li>• <b>Failure to implement best environmental practice by the Mining sector. This sector generate dust and they operate very close to human settlements.</b></li> </ul>
	<b>The use of fossil fuels in residential areas</b>	<b>Public and DMRE</b>	<ul style="list-style-type: none"> <li>• <b>Lack of affordable cleaner alternative fuels. Domestic coal burning is one of the major source of air pollution.</b></li> </ul>
	<b>Waste burning</b>	<b>Public / municipalities / Government</b>	<ul style="list-style-type: none"> <li>• <b>Lack of service delivery result into general burning of waste by the community.</b></li> </ul>
	<b>Vehicle emissions, (lack of transport)</b>	<b>Public and Government</b>	<ul style="list-style-type: none"> <li>• <b>Lack of public transport infrastructure.</b></li> </ul>
	<b>Blomass burning( veld fire)</b>	<b>Public and Government</b>	<ul style="list-style-type: none"> <li>• <b>Service delivery( lack of fire management)</b></li> </ul>

The AQMP stipulate emission reduction targets for the sectors mentioned in the above table. The regulations will assist in ensuring that all these sectors are held accountable to the commitment in the AQMP. Where possible punitive measures will be stipulated to discourage non-compliance. The department has enforcement wing called Green Scorpion which is responsible for enforcing environmental legislation.



**1.4. Please explain why implementation of the existing policies/ laws/regulations or any proposals are not effective in addressing identified problems.**

Identified Problem	Behaviour giving rise to the identified problem	Groups whose behaviour give rise to the identified problem?	Existing regulatory tools	Why are the tools not effective
<p>The air in the area does not meet the National Air Quality Standards due to the ineffective implementation of the AQMPs.</p>	<p>Failure by the industry to reduce emissions</p>	<p>The Industrial Sector</p>	<ul style="list-style-type: none"> <li>• Section 21 Notice,</li> <li>• Section 23 Notices,</li> <li>• Dust Regulations,</li> <li>• Section 22A,</li> <li>• Air quality management by-laws,</li> <li>• Air quality ambient standards,</li> <li>• AQMP,</li> <li>• NAEIS reporting regulations,</li> <li>• Air quality offsets guideline.</li> </ul>	<ul style="list-style-type: none"> <li>• Postponement of compliance timeframes provision (Section 21 notice). This provisions defer the compliance by industry to a future compliance date. The provision was meant to allow existing facilities retrofit relevant technology to reduce emissions.</li> <li>• Lack of compliance monitoring and enforcement of the existing tools</li> <li>• Minimum Emission Standards are not strict enough for the priority areas</li> </ul>
	<p>Failure to manage dust emission from the Mines</p>	<ul style="list-style-type: none"> <li>• Industry and Government</li> </ul>	<ul style="list-style-type: none"> <li>• Dust control regulation,</li> <li>• AQMP,</li> <li>• NAEIS reporting regulations,</li> <li>• EIA Regulations,</li> <li>• Section 21.</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of clarity on the roles and responsibilities (DMRE and DEFF). The current legal arrangements do not allow DEFF to enter the mines. Only DMRE has jurisdiction in the mines</li> </ul>
	<p>The use of fossil fuels in residential areas</p>	<ul style="list-style-type: none"> <li>• Public and Government - DMRE</li> </ul>	<ul style="list-style-type: none"> <li>• Low income dense strategy,</li> <li>• By-laws</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of funding for cleaner alternative fuels. Poor</li> </ul>

			<ul style="list-style-type: none"> <li>• LPG strategy</li> </ul>	communities still rely on coal for space heating and cooking.
	Waste burning	Public/ Government Municipalities	<ul style="list-style-type: none"> <li>• Low income dense strategy,</li> <li>• By laws</li> <li>• Waste management strategy</li> <li>• Green good deeds</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of enforcement of the municipal waste by-laws and</li> <li>• Failure to remove waste by the municipality, and</li> <li>• Collapse of municipalities.</li> </ul>
	Vehicle emissions, (lack of transport)	Public and Government	<ul style="list-style-type: none"> <li>• Department of Transport Green transport strategy,</li> <li>• By-laws</li> <li>• Fuel spec strategy-DMRE</li> <li>• Vehicle emission strategy-DEFF</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of implementation of the strategy</li> </ul>
	Biomass burning(veld fire)	Public and Government	<ul style="list-style-type: none"> <li>• By-law,</li> <li>• Veld fire management</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of implementation and lack resources</li> </ul>

**1.5. Identify the major social and economic groups affected by the problem, and how are they affected. Who benefits and who loses from the current situation?**

Identified Problem	Groups (Social/Economic)	How are they affected by the identified problem?	Are they benefitting or losing from the current situation?
The air in the area does not meet the National Air Quality Standards due to the ineffective implementation of the AQMPs.	Vulnerable groups (Women, Youth, Children, People with Disabilities)	<ul style="list-style-type: none"> <li>• Their health and well-being are negatively effected</li> <li>• Refer to the summary of the health study report below</li> </ul>	Women, Youth, Children, and People with Disabilities are not benefitting.
	Low-income groups	Their health and well-being are negatively effected Refer to a brief summary of the health study report below	Women, Youth, Children, and People with Disabilities are not benefitting.

## **Air Quality Health Study**

The department undertook the air quality health impact assessment study in VTAPA and HPA. An assessment of health impacts (VTAPA health study) was conducted in Diepkloof, Sebokeng, Sharpeville and Zamdela. The study was comprised of three parts, namely: Human Health Risk Assessment (HHRA), Community Health Survey and Medical/ Child Health Survey.

The study showed that the communities are at high risk of acute and chronic health effects due to exposure to PM, NO<sub>x</sub> and SO<sub>2</sub>.

The Highveld Priority Areas health study finding reveals through Human Health Risk impact Assessment for air pollution levels (i.e. specially for PM<sub>10</sub> and PM<sub>2.5</sub> levels) on the cases of mortality estimated a 4 881 decrease in PM<sub>2.5</sub> attributable mortality if annual PM<sub>2.5</sub> NAAQS were met, whereas the estimated lives that could have been saved by meeting the annual NAAQS for PM<sub>10</sub> is 5 125 people. Findings of the report concluded that there is a chance to save thousands of lives if annual PM NAAQS were met, and further more recommended that it is essential to meet improve air quality to meet NAAQS and to save lives.

The overall findings of the Health study reports shows that air quality has negative impact on the health of people, and DEFF must priorities the management of air quality, including the implementation Air Quality Management Plan (AQMP).

Air pollution knows no boundary and has the potential to affect everyone, but it can affect us differently depending on the distance from the pollution sources, and also the vulnerability level of our body systems. Children, elderly people and those with respiratory diseases such as asthma, they are the most vulnerable to air pollution. Most of the people in the priority areas, are working and staying closer to the source pollution such as industries, main road and unpaved road, and mine etc. Most vulnerable group that are easily affected by air pollution are women, youth, children, and people with disabilities, because most of the time they are found within the same area for a very long, most of them are staying in informal settlement, and their houses have poor insulation, they also use dirty fuels for cooking and space heating, and as a result these group turn to lose if air pollution levels are not managed properly.

## 2. Options

**2.1. Describe least three options for addressing the identified problem, including (a) your preferred proposal, and (b) an option that does not involve new or changed regulation (baseline or existing option)**

- a) **Effective implementation of Priority area AQMP through the proposed regulations. This will make all stakeholders to be held accountable.**
- b) **Implementation and enforcement of the existing tools like Atmospheric Emission License, Dust Control Regulations**
- c) **Service delivery improvement in the priority areas. This will improve waste collection, manage veld fires, tarring of dusty roads and reduce usage of dirty fuels in the residential areas.**

**2.2. Are the proposed options linked to other existing government laws or regulations and what are the gaps / limitations of those existing ones to address your identified problem?**

<b>Government legislative prescripts</b>	<b>Custodian department / units within your department</b>	<b>Areas of Linkages</b>	<b>What are the limitations of existing prescripts?</b>
<b>The Constitution of R.S.A 1996  Section 24, 27 and 28 basic human rights.</b>	<b>Department of Justice</b>		<b>No limitations</b>
<b>Air quality Act 2004 – Regulates air quality activities, promote clean air to ensure protection of the environment and human health.</b>	<b>Department of Environment Forestry and Fisheries</b>	<b>Section 18,19</b>	<b>The Act recommended the development of Priority Area regulations</b>
<b>National Health Act 2003 –</b>			

Provision of health services, includes preventative health care service, i.e. Environmental health.			
Scope of Profession for Environmental Health –		List environmental health functions, which includes environmental pollution control and health surveillance of premises.	
The 2017 Draft National Air Indoor air Pollution Strategy (DEA)		AQA maps out the path that the country needs to take in reducing the impact of air pollution in dense low income communities.	Poor intake by the affected persons
MPRDA: Section 43(1-13)	DMRE	Management of dust in the mines	Lack of intergovernmental and interdepartmental coordination
NEMA: EIA regulations  NEMA: EIA regulations Section 34 and 35	DEFF( DMRE listed as competent authority)	Management of dust in the mines	Poor enforcement of the Environmental Impact Assessment regulations
Integrated Resource Plan (IRP)	DMRE	Domestic fuel and energy supply	The plan is heavily reliant on fossil fuels
Veld and forestry Fire Act: Section 12 (1) (2)	Agriculture / forestry	Biomass burning	Effective implementation of the act in the priority area
Green transport strategy	Department of Transport	Vehicle emission	Lack of implementation of the strategy in the priority area

**2.3. What social groups would gain and which would lose most from the each of the three or above options? Consider specifically the implications for the households earning less; micro and small business; black people, youth and women; and rural development.**

Option	Main Beneficiaries	Main Cost bearers
<p>a) Develop the priority area AQMP regulations</p>	<p>Women, Youth, Children, People with Disabilities Low Income groups</p>	<p>Industry, Mines, All spheres of government, DMRE, DoT and DPE</p> <ul style="list-style-type: none"> <li>• The local government should invest in waste collection, tarring of local roads and management of monitoring stations</li> <li>• Department of Transport should invest in public transport (particularly trains and green buses)</li> <li>• Provincial government should invest in management of landfills, maintenance of provincial roads</li> <li>• DMRE and DEFF should Invest in capacity to enforce current laws</li> <li>• DMRE and DPE should assist Eskom to invest in technologies that reduce emissions</li> <li>• Industries should invest in technologies that reduce emissions</li> <li>• The mines will invest in technologies to reduce dust</li> </ul>
<p>b) Implementation of the existing regulatory tools</p>	<p>Women, Youth, Children, People with Disabilities Low Income groups</p>	<p>Industry, Mines, all spheres of government, DMRE, DoT and DPE</p> <ul style="list-style-type: none"> <li>• The local government should invest in waste collection, tarring of local roads and management of monitoring stations</li> <li>• Department of Transport should invest in public transport (particularly trains and green buses)</li> <li>• Provincial government should invest in management of landfills, maintenance of provincial roads</li> <li>• DMRE and DEFF should Invest in capacity to enforce current laws</li> <li>• DMRE and DPE should assist Eskom to invest in technologies that reduce emissions</li> <li>• Industries should invest in technologies that reduce emissions</li> <li>• The mines will invest in technologies to reduce dust</li> </ul>

Women, youth, children, and people with disabilities group always find themselves indoors with poorly ventilated houses, where dirty fuel are used for cooking and space heating. As a result they are subjected to poor air quality and get sick. Most of them they end up not accessing appropriate health care services for symptoms related upper and lower respiratory illness. Some of them end up seek help from other sources rather than health care professionals, and as a result most sickness are not diagnosed. Most of them turns to seek medical attention when they are critically sick. Most of the school going children, and working class turn to be absent as a result of such sickness.

**1.6. Which of below Seven (7) national priorities are negatively affected by the identified problem?**

National Priority	How is the priority negatively affected by the identified problem?
1. Economic Transformation and Job Creation	<ul style="list-style-type: none"> <li>• Poor air affect the health of the population in generation. Those whose health are negatively affected become unproductive thus affecting the economy of the country.</li> </ul>
2. Education, Skills and Health	<p>Health and well-being of community living in the priority areas are negatively affected by the pollution in the area, and people are lack knowledge on the impact of air pollution on their health</p> <ul style="list-style-type: none"> <li>• Use of dirty fuel in household/ indoor has negative impact on the health of people</li> <li>• Emissions from industries, vehicles and mining and any other sources can also contribute to poor ambient air quality, which in turn can affect the health.</li> </ul>
3. Consolidating the Social Wage through reliable and quality Basic Services	
4. Spatial Integration, Human Settlements and Local Government	
5. Social Cohesion and Safe Communities	
6. Building a Capable, Ethical and Developmental State	
7. A better Africa and World	

c) Service delivery improvement in the priority areas.	Women, Youth, Children, People with Disabilities Low Income groups	<p>All spheres of government.</p> <ul style="list-style-type: none"> <li>• The local government should invest in waste collection, tarring of local roads and management of monitoring stations</li> <li>• Department of Transport should invest in public transport (particularly trains and green buses)</li> <li>• Provincial government should invest in management of landfills, maintenance of provincial roads</li> <li>• DMRE and DEFF should invest in capacity to enforce current laws</li> </ul>
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**2.4. For each option, describe the possible implementation costs, compliance costs and the desired outcomes, listing who would bear the costs or, in case of the outcomes, enjoy the benefits.**

Option	Implementation costs	Compliance costs	Desired Outcomes (Benefits)
a) Develop the priority area AQMP regulations	Additional enforcement capacity R 5 Million/ annum	<p>The DEFF cost benefit analysis study estimated the cost of complying with the current legislation as follows: WBPA: R99 billion VTAPA: R183 billion HPA: R121 billion</p> <p>The cost are same for all the scenarios because the calculations are based on complying with air quality acts.</p>	Compliance with the ambient standard
b) Implementation of the existing tools	Additional enforcement capacity R 5 Million/ annum		Compliance with the ambient standard
c) Service delivery improvement in the priority areas.			Compliance with the ambient standard



**2.5. Based on the above table on costs and benefits, describe how different options would contribute to or detract from the national priorities. Remember this is a think-tool, so explore the issues freely.**

Priority	Option 1	Option 2	Option 3
1. Economic Transformation and Job Creation	The industry will bear the cost of compliance and some of them might close. This will negatively affect the job creation and economic stability	The industry will bear the cost of compliance and some of them might close. This will negatively affect the job creation and economic stability	Government will bear the cost.
2. Education, Skills and Health	Health and wellbeing of the community will improve. The health care cost will be reduced.	Health and wellbeing of the community will improve. The health care cost will be reduced.	Health and wellbeing of the community will improve. The health care cost will be reduced.
3. Consolidating the Social Wage through reliable and quality Basic Services			
4. Spatial Integration, Human Settlements and Local Government			
5. Social Cohesion and Safe Communities			
6. Building a Capable, Ethical and Developmental State			
7. A better Africa and World			

**2.6. Describe the potential risks that could threaten implementation of each option and indicate what can be done to mitigate the identified risks.**

Option	Potential Risks	Mitigation Measures	Comments
a) Develop the priority area AQMP regulations	Lack of capacity to enforce regulations	Provide additional enforcement capacity	
b) Implementation of the existing regulatory tools	Failure to implement current legislation	Improve the current legislation by including harsh penalties	
	Lack of capacity to enforce regulations	Provide additional enforcement capacity	
	The existing legislation not sufficient (water tight) for litigation	Improve the current legislation or develop new regulations	
c) Service delivery Improvement in the priority areas.	Collapse of the municipalities.	Motivate for the provincial takeover of the air quality functions	
	Budget cuts	Encourage public and private sector partnerships	
	Some air pollution sources might not be addressed through service delivery	Additional regulatory tool might be needed	

### 3. Summary

**3.1. Based on your analysis, as reflected in the discussion of the three options above, summarise which option seems more desirable and explain?**

- **AQMP Regulations - To be more prescriptive on the compliance with the AQMP. The regulations will be targeted towards the AQMP thus making them more efficient to achieve the goals of the AQMP.**

**3.2. What specific measures can you propose to minimise the implementation and the compliance costs of your preferred option, to maximise the benefits?**

- **It is unlikely that the cost can be minimised. The cost of compliance are the same for all options.**

**3.3. What are the main risks associated with your preferred option, and how can they best be managed?**

- **Closure of some industrial and mining facilities. The facilities that cannot afford to invest in environmentally friendly technologies might close down. This risk could be managed by giving industries more time to comply.**
- **Risk of litigations from Non-Governmental Organisations. The NGO are likely to use the proposed regulations to litigate against industries and government.**

**3.4. What additional research should you do to improve your understanding of the costs and benefits of the option adopted?**

**The external cost associated with air pollution impact is not well understood. The department through the Medical Research Council (MRC) could initiate a study to improve the cost-benefit study that was conducted by the department.**

**For the purpose of building SEIAS body of knowledge please complete the following:**

<b>Name of Official/s</b>	Dr Vincent Gololo
<b>Designation</b>	Department of Environment Forestry and Fisheries
<b>Unit</b>	Atmospheric Policy Regulations and Planning
<b>Contact Details</b>	Tel: 012 399 9202/ 066 064 8985
<b>Email address</b>	<a href="mailto:vgololo@environment.gov.za">vgololo@environment.gov.za</a>