

# AIR QUALITY MANAGEMENT IN GAUTENG PROVINCE

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OFFICER



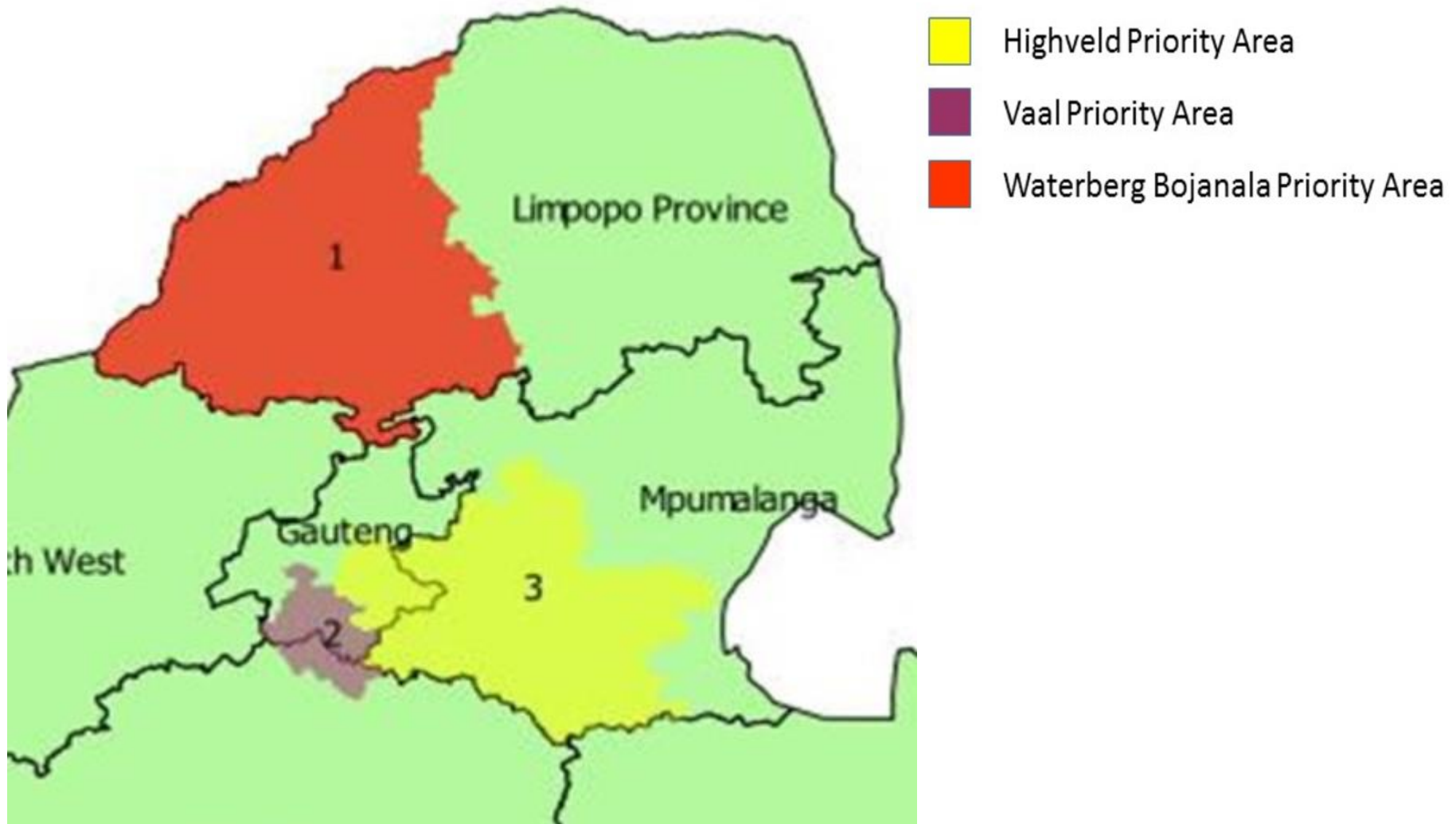
# OVERVIEW OF THE PRESENTATION

- Introduction
- Air Quality Priorities of Gauteng
- AQMP Review- Baseline Assessment
  - Emissions Reporting & Trends Analysis
  - Sources of Significant concern to deal with
  - Air Quality Baseline Data Analysis
  - Areas of Achievements and Improvement
  - Information Management
- Ambient Air Quality Monitoring
  - PM<sub>10</sub> AND PM<sub>2.5</sub> yearly averages
  - Achievements on ambient monitoring
  - Air quality information Management
  - Challenges on Air Quality
- Way forward or Vision for Air quality
- Conclusions

# INTRODUCTION

- Gauteng is a small province of about 1.5km<sup>2</sup>
- It has 2 of National Declared Priority Areas (Vaal Airshed and Highveld)
- Comprise of 3 Metros and 2 District Municipalities which are primary implementers of air quality management functions
- GDARD is also an AEL authority but most importantly play a supportive and oversight role on air quality

# PRIORITY AREAS WITHIN AND AROUND GAUTENG



## AIR QUALITY PRIORITIES OF GAUTENG

- AQMPs Reviews to align to latest developments within the province including municipalities
- Maximization and efficiency of ambient air quality monitoring
- Issuing of quality AELs to listed activities and identification and registration of Controlled Emitters
- Implementation of air pollution reduction programmes together with municipalities
- Collaboration with Compliance and Enforcement on inspections of identified top priority polluters
- Capacity development on air quality issues (staff, skills)

## OTHER RELATED GAUTENG PRIORITIES

- Manufacturing and Agro Processing
- Re-industrialization and Modernization of Gauteng
- Transform Gauteng to low Carbon Economy
- Investment on Infrastructure development and other economic development

## GAUTENG AQMP REVIEW

- Gauteng is reviewing its 2009 AQMP to be suitable adequate with provincial latest developments
- Gauteng municipalities are represented in the Project Steering Committee and National DEA will also be included
- The AQMP review is to enhance air quality management and skills development
- Gauteng air quality baseline assessment will indicate provincial air quality status
- The new developed AQMP must provide provincial air quality synopsis of areas of concern

## AQMP REVIEW CONTINUES

- The plan must enable Gauteng to move in one direction in terms of air quality implementation.
- Enable Gauteng province to provide supportive and oversight role to AEL Authorities
- Facilitate coordination of air quality related projects within municipalities



## AIR QUALITY BASELINE ASSESSMENT-AQMP

- The baseline was done using NAEIS 2015/16 Emissions reported data by industries
- Not all the Facilities required to report reported their emissions
- The focus is or the results are on audited and verified emission reports
- The baseline also focus on priority sources and problematic pollutants within Gauteng province
- The baseline provide the yearly ambient monitoring performance
- It indicate sources of concern in terms of monitoring by the Authorities

## AIR QUALITY BASELINE ASSESSMENT-AQMP

- Authorities reports in terms of number of Facilities**

Authorities	Number of registered facilities on the NAEIS	Number of NAEIS Reports submitted	Percentage (%) Reports submitted
City of Johannesburg	38	36	95
City of Tshwane	56	31	55
City of Ekurhuleni	177	80	45
GDARD	8	8	100
Sedibeng DM	34	22	65
Westrand DM	39	11	28
Provincial total	352	188	53

## INDUSTRIAL EMISSIONS REPORTED

- 352 industrial facilities in Gauteng registered in the NAEIS
- 335 Listed Activities and 17 Controlled Emitters.
- 188 facilities submitted emissions reports for 2015, comprising 53.4% of all registered facilities

Industrial sector	Number of facilities
Chemical Industry	19
Food Processing	1
Funeral Service and Crematories	8
Metallurgical Industry	71
Mineral Processing	44
Miscellaneous	6
Petroleum Industry	23
Power Generation	2
Pulp and Paper/ Wood Processing	4
Waste	10
<b>Total</b>	<b>188</b>

## Emissions from industry as per AELA (tons/annum)

AELA	PM <sub>10</sub>	PM <sub>2.5</sub>	TSP	SO <sub>2</sub>	NO <sub>x</sub>	CO	Pb	VOC	NH <sub>3</sub>
City of Joburg	220	95	10	33,928	9,766	92,888	4	782	361
City of Tshwane	3,398	188	26	352,981	29,605	29,988	0	1,817	0
City of Ekurhuleni	9,947	6,538	570	16,643	6,065	1,677	612	3,686	9
Sedibeng DM	26,776	922	1,009	12,366	2,668	197,115	1	5,562	292
Westrand DM	1,062	11	147	136	1,624	91	19	0	0
Gauteng Total	41,402	7,755	1,762	416,054	49,729	321,760	636	11,847	662

# Emission Per Categories(tons/annum)

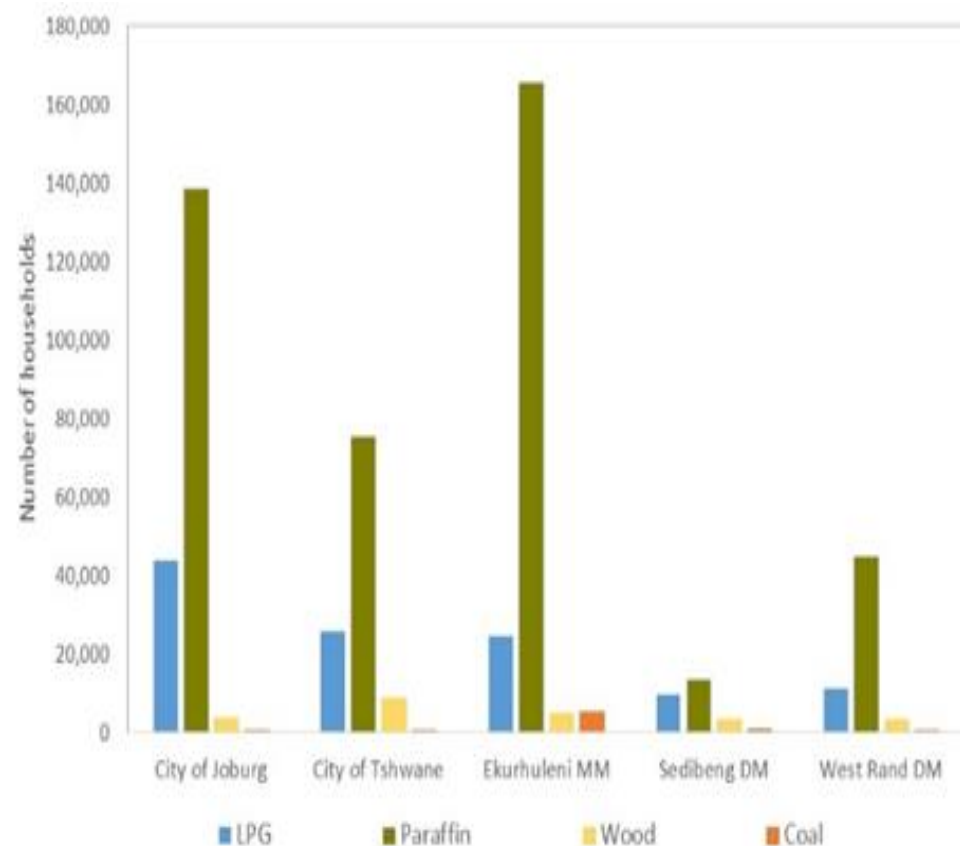
	PM <sub>10</sub>	PM <sub>2.5</sub>	TSP	SO <sub>2</sub>	NO <sub>x</sub>	CO	Pb	VOC	NH <sub>3</sub>
Chemical industry	347	0.0	0.0	4.4	5.3	656	0.0	2.2	0.0
Food processing	803	9.4	142	0.0	67.4	74.8	18.7	0.0	0.0
Funeral services & crematoria	0.9	0.0	5.5	0.7	4.5	18.4	0.0	0.0	0.0
Metallurgical industry	28,863	3,863.9	1,410	8,893	3,620	196,153	1.7	6,946	311
Mineral processing	10,486	266	28.4	386,257	41,397	62,914	5.0	890	0.0
Miscellaneous	227	48.3	6.7	1,129	526	0.0	0.0	0.2	351
Petroleum industry	0.0	0.0	0.0	15,458	0.0	61,626	0.0	3,978	0.0
Power generation	640.5	3,532	0.0	4,151	3,929	164	4.3	0.1	0.0
Pulp and Paper/Wood processing	30.8	34.1	169	158	171	121	607	30.4	0.0
Waste	3.6	0.0	0.0	2.5	8.3	33.0	0.0	0.8	0.1
Total	41,402	7,755	1,762	416,054	49,729	321,760	636	11,847	662

## Emissions from Mining & Tailing Facilities

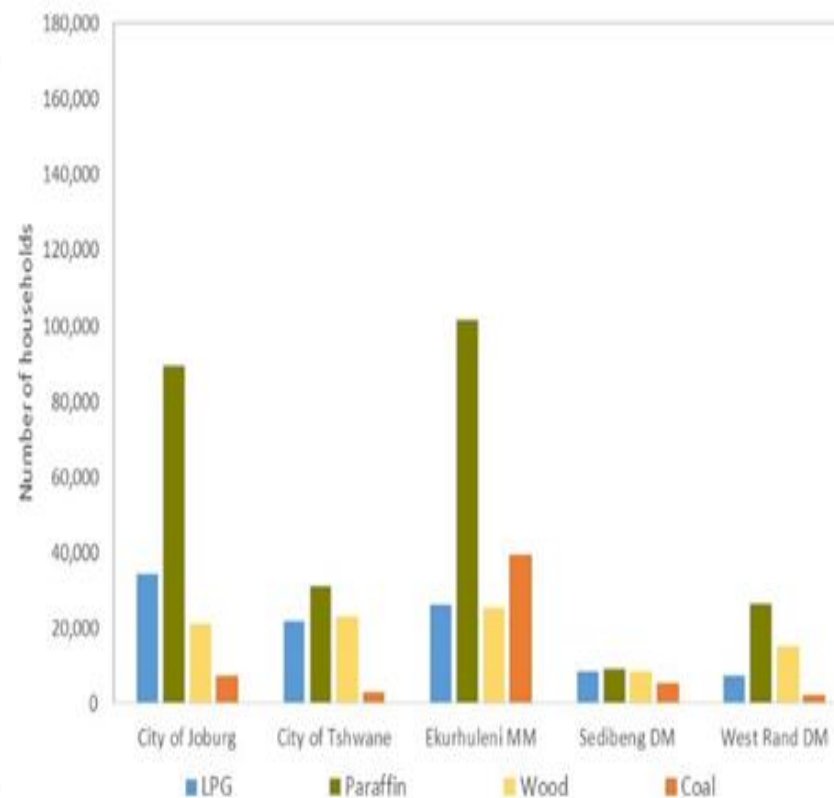
- 197 mines and quarries in Gauteng registered with the DMR
- Opencast mining is the most common approach and accounts for nearly 68% of the mining
- 33 mines in Gauteng reported emissions to the NAEIS for 2015, 15.2% of registered mines
- Strategy and implementation plan for mine residue areas (MRA) (GDARD, 2012) reports that there are 374 MRAs in Gauteng, from 1 to 1,647 ha and collectively make up an area of 32 000 ha

# TYPE OF FUEL USED AT RESIDENTIAL SECTOR

## Type of Fuel used for Cooking Purposes

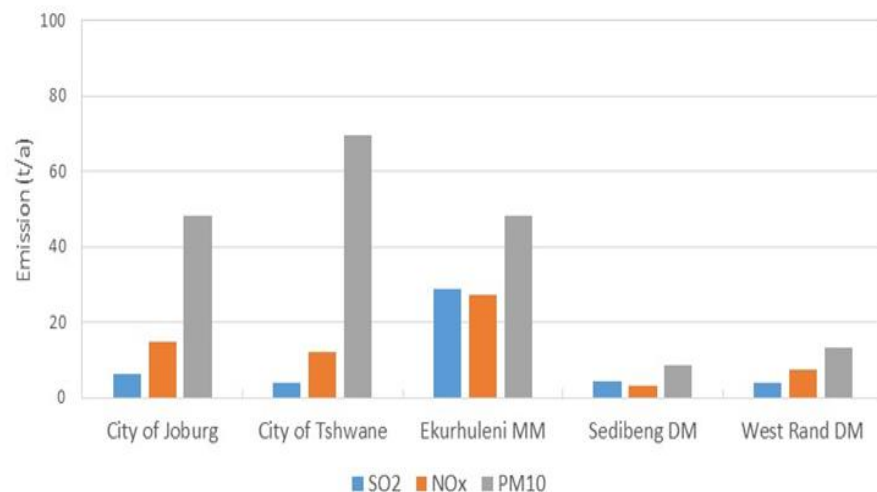


## Type of fuel for Space Heating



# Emissions from residential fuel burning (t/a)

	SO <sub>2</sub>	NO <sub>x</sub>	CO	PM <sub>10</sub>
City of Joburg	6	15	369	48
City of Tshwane	4	12	529	70
City of Ekurhuleni	29	27	434	48
Sedibeng DM	5	3	77	8
West Rand DM	4	8	104	13
Gauteng	47	65	1514	188





## Pollutants and Air Pollution Sources to Note

- Ambient concentrations of **NO<sub>2</sub>**, **PM<sub>10</sub>**, **PM<sub>2.5</sub>** and **O<sub>3</sub>** are highly and frequently exceed the NAAQS at most stations in Gauteng
- Motor vehicle are the largest source of **NO<sub>x</sub>** emissions (**56.6%**) followed by industrial emissions (**38%**). The metallurgical industry contributes **85%** of the industrial emission
- Industry is the largest contributor to ambient **PM<sub>10</sub>** concentrations (**60%**), followed by mining (**21%**). The metallurgical and mineral processing industries account for **95%** of the total emission from industry

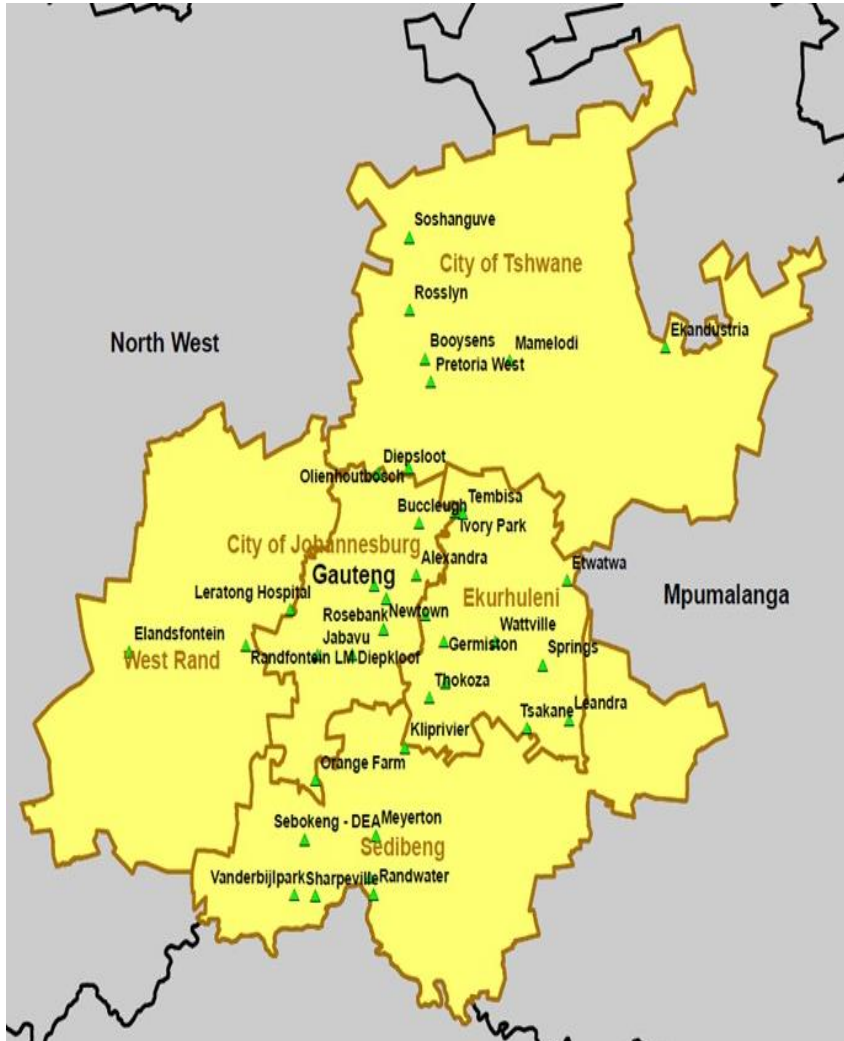
## Pollutants and Air Pollution Sources Continues

- Biomass burning is the largest contributor to ambient **PM<sub>2.5</sub>** concentrations, followed by industry (**32%**)
- **Metallurgical** industry and the **Power Generation** account for 95% of the PM<sub>2.5</sub> emission from industry
- The high ambient **O<sub>3</sub>** concentrations throughout Gauteng is attributed to emissions of precursors **NO<sub>x</sub>, VOCs and CO**.
- The major sources of **O<sub>3</sub>** are motor vehicles, the **metallurgical and mineral processing** industry and biomass burning
- Fugitive emissions of TSP results in high dust loading
- Residential fuel burning, relatively low particulate emission but released in the breathing zone

## SOURCES OF CONCERN TO PRIORITISE

- **Motor vehicles:** Contribution to high ambient  $\text{NO}_2$  and  $\text{O}_3$  concentrations
- **Metallurgical industry and Mineral processing:** Contribution to high  $\text{PM}_{10}$  and  $\text{PM}_{2.5}$  concentrations
- **Biomass burning:** Contribution to high  $\text{PM}_{2.5}$  and  $\text{O}_3$  concentrations and atmospheric particulate loading
- **Tailings storage facilities:** Contribution to high atmospheric particulate loading, high  $\text{PM}_{2.5}$  concentrations and dust deposition
- **Residential fuel burning:** Contribution to high local  $\text{PM}_{10}$  concentrations

# AMBIENT AIR QUALITY MONITORING



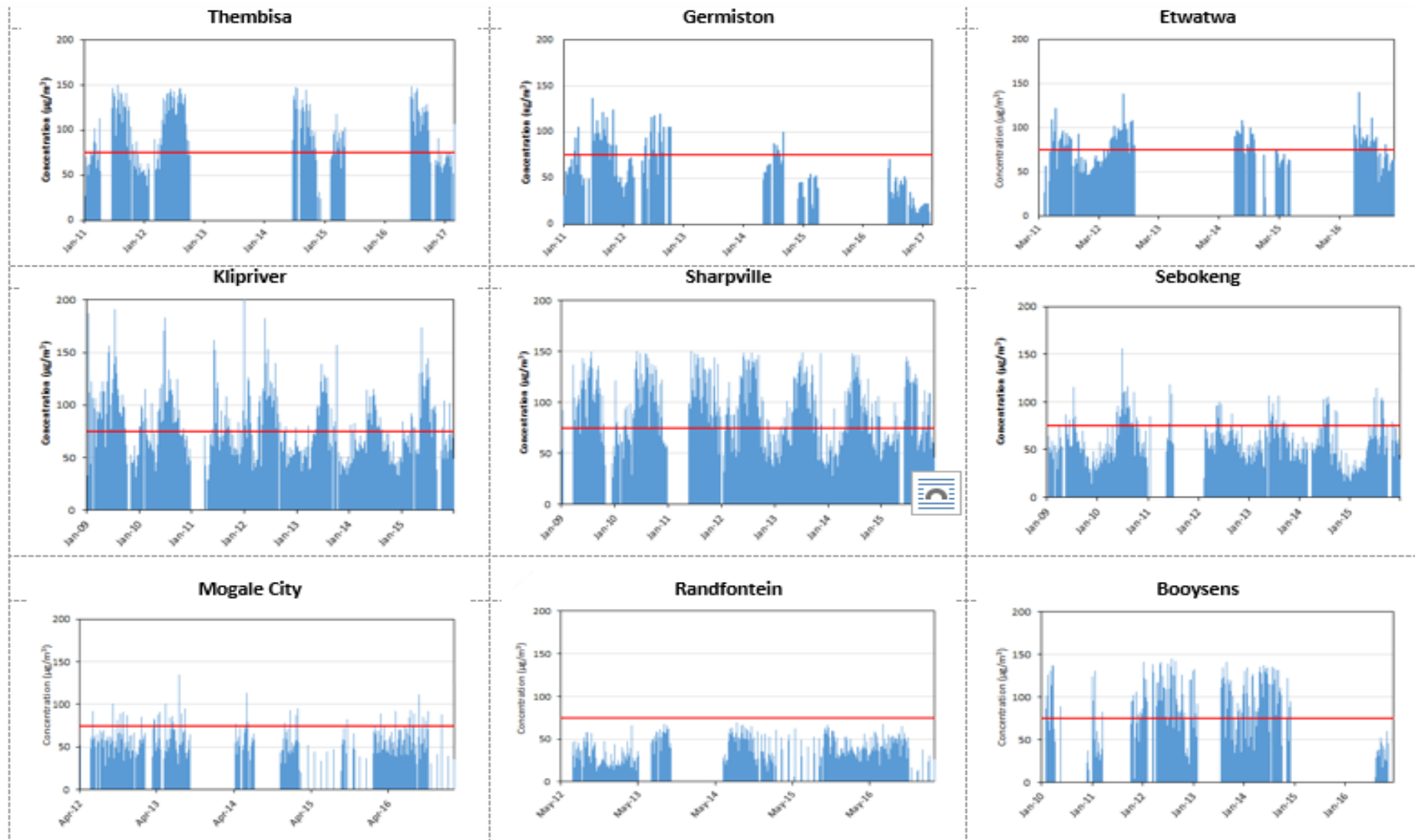
**35 continuous ambient monitoring stations in operation for different periods, between 2009 and 2015, operated by:**

- **AEL Authorities and DEA**
- **Private Stations**

## GAUTENG POTENTIAL CONDITIONS TO DISPERSE POLLUTANTS

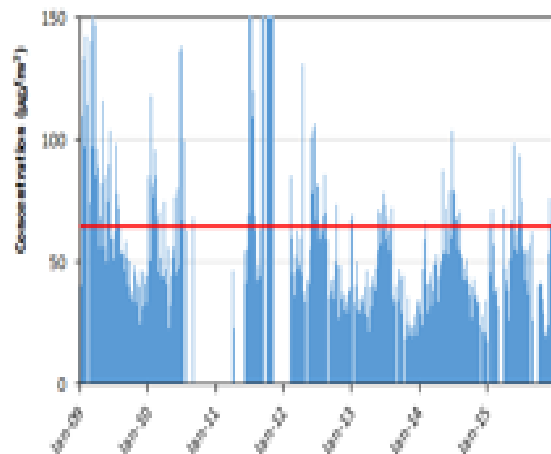
- Gauteng lies in 2 climatic zones- Central to Northward side and Highveld side with hot summer and cold winter
- These climatic zones has both negative and positive impacts to air pollution dispersion
- Gauteng region has poor potential to disperse pollutants
- The dispersion potential of Gauteng provide diurnals of seasonal variations in Gauteng

# 24 HOURS PM<sub>10</sub> AVERAGES IN SOME AREAS OF GAUTENG

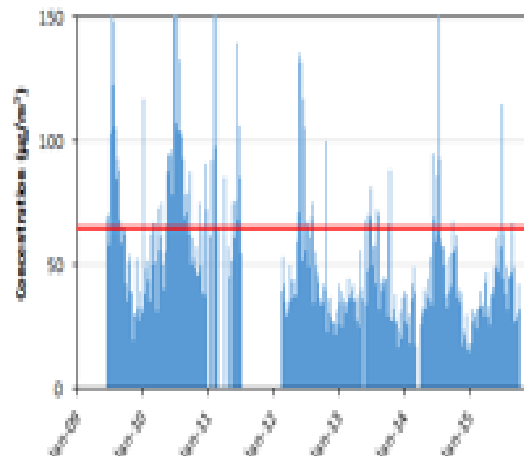


# 24 HOURS PM<sub>2.5</sub> AVERAGES IN SOME AREAS OF GAUTENG

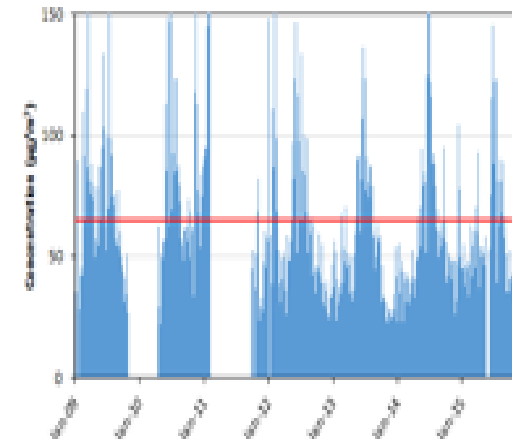
Klipriver



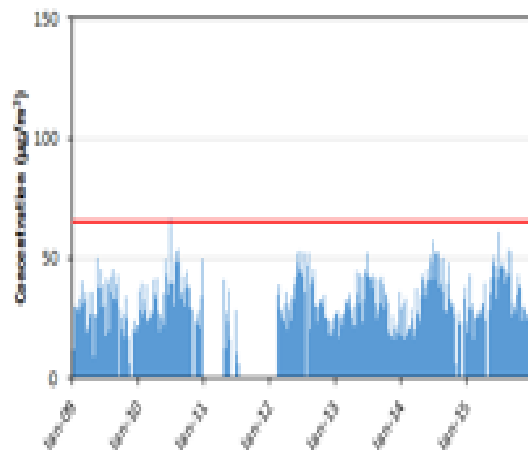
Sebokeng



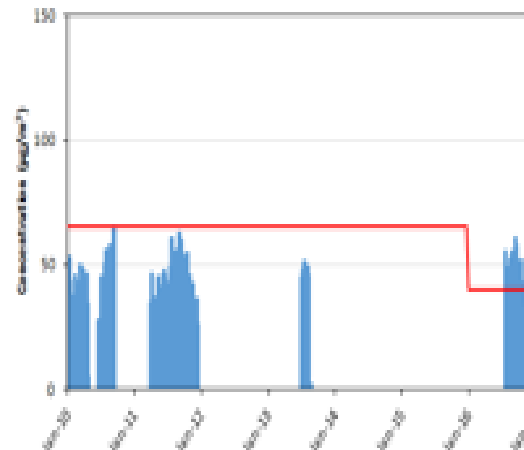
Sharpville



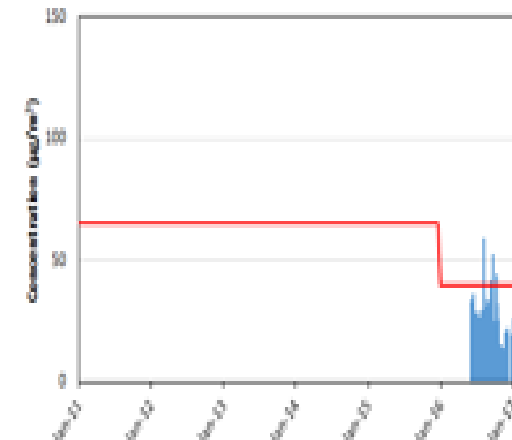
Three Rivers



Buckleigh



Bedfordview



## POINTS TO NOTE ON AMBIENT MONITORING

- Collectively, the municipal ambient air quality monitoring provide a reasonable spatial coverage for Gauteng
- Quality control of data submitted to the SAAQIS is not consistent and lacking
- Data gaps suggest that routine station maintenance is lacking at some monitoring stations
- There is a clear seasonal cycle in all pollutants with the higher concentrations in winter



## SOME ACHIEVEMENTS OF AMBIENT SUB COM

- GDARD secured a 2 years tender on maintenance of 10 ambient stations to build capacity and resuscitate monitoring within the province, following are benefits:
- Technical skills in calibration, zero span and ambient station management
- Improved number of operational stations and data recovery
- Improved utilization of air quality data to plan air quality reduction programmes
- Support from our principals is improving

## INFORMATION MANAGEMENT WITHIN THE PROVINCE

- Information sharing occurs at the Air Quality Forum, daily basis in all air quality matters
- Established 2 Sub Committees to strengthen air quality management (AELs and Ambient monitoring)
- Streamlining of air quality issues into service delivery programmes
- Both Gauteng IGR Committees (Technical and Political) entertain air quality management issues

## INFORMATION MANAGEMENT AND SUPPORT

- Training of industries on NAEIS reporting and support to the Authorities during auditing
- Joint physical inspections of listed activities to issue AELs and collaboration with EMIs on Compliance issues
- Implementation of some air quality reduction projects together e.g BnM & Methanol stoves
- Provide support to Authorities at ITTs within Gauteng including MSRG
- Capacity development to air quality officials within the province

## SOME CHALLENGES WITHIN AIR QUALITY MANAGEMENT

- In some AEL Authorities 1 person is doing all air quality functions which is risky to Authority
- Continuous allocation of resources (Budget and Staff)
- Lack of advanced developmental Courses in some areas of air quality especially to experienced staff
- Evolvment of some pollutants exceedances during monitoring e.g O<sub>3</sub> in Tshwane, Sedibeng
- Ageing of equipment is a challenge

## AIR QUALITY VISION OF THE PROVINCE

- To have all 5 AEL Authorities declared priority areas
- Align air quality management to Gauteng developmental priorities
- Provide effective and efficient support to AEL Authorities
- Provincial wide implementation of reduction strategies
- Immediately deal with the identified sources of air pollution within the province
- Create more of awareness and educational programmes within the communities and Stakeholders
- Better skills utilization and capacity development within the Province

## CONCLUSION

- Air Quality forms the integral part of development and is better managed at planning stage
- There is a greater need to develop a pool of air quality skills/knowledge throughout the Province
- Air quality Competitors (industries and Consultants) place a huge strain on AEL Authorities by recruiting their developed staff

**WITH COMPLIMENTS FROM GAUTENG AIR QUALITY  
OFFICIALS (GDARD AND MUNICIPALITIES)**

**I THANK YOU**