2017 STATE OF AIR REPORT AND NATIONAL AIR QUALITY INDICATOR

Session 1.3
Monday, 02 October 2017

environmental affairs
Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

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National Air Quality Officer
12th Air Quality Governance Lekgotla
Cedar Woods – Sandton, Gauteng Province
02 – 03 October 2017

20 YEARS OF FREEDOM

Outline of the Presentation

- 2017 State of Air Report in South Africa
- State of Ambient Monitoring in 2016
- South African Air Quality – Comparison with International Examples
- New Development in AQ Monitoring
- Conclusions

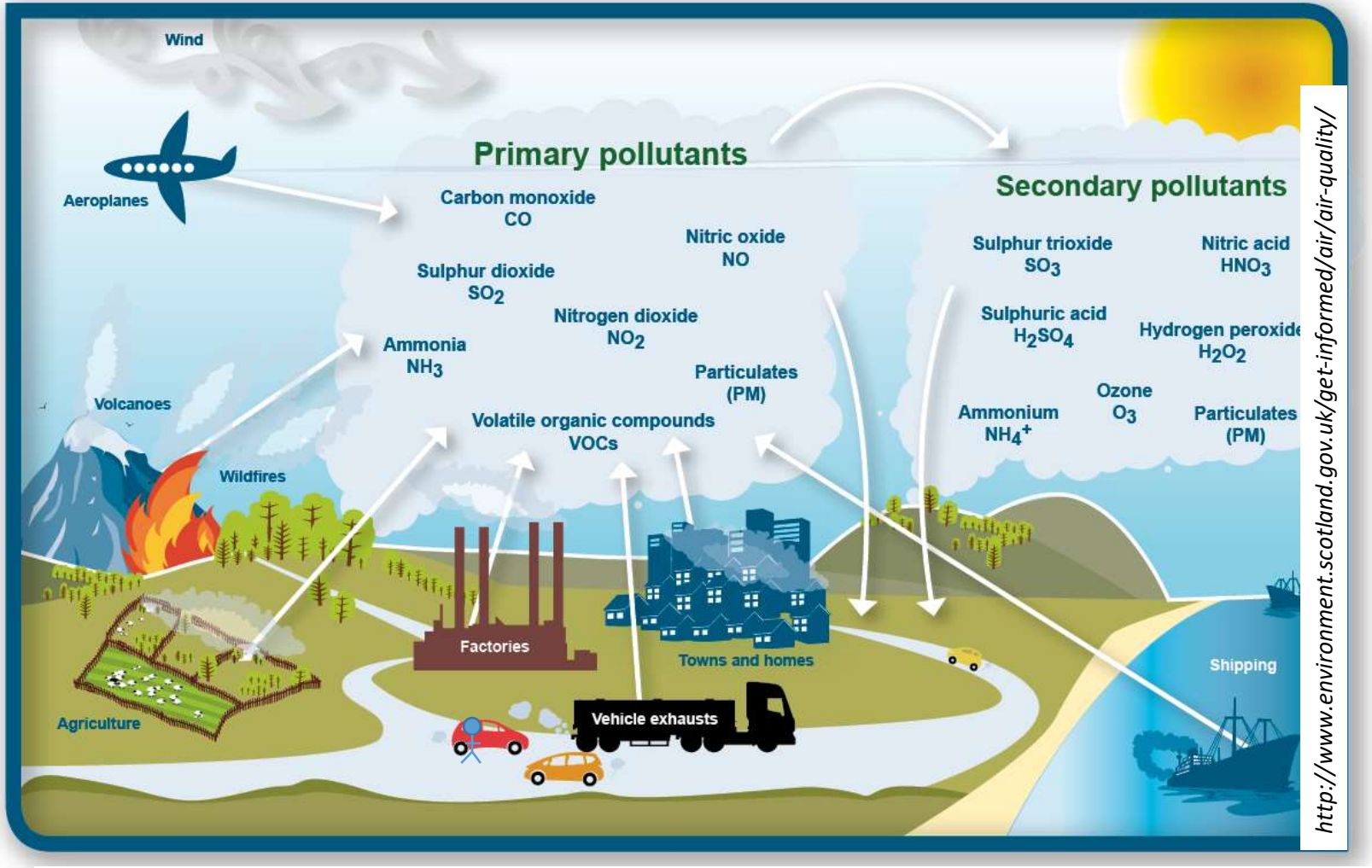
Objective

- To provide an overview of the 2017 State of Air Quality (2005-2016);
- Data presented is from networks that met minimum data requirements:
  - Major Metropolitans
  - Western Cape Province;
  - National Priority Areas;
  - Richards Bay Clean Air Association;
  - Sasol and Eskom; and
  - COEGA ambient air quality monitoring stations,

Why DEA Presents the State of Air Report

- To enable the people of South Africa to make an assessment of the air quality on the basis of their right to an environment (air – in this case) that is not harmful to their health and well-being;
- To generate the necessary passion for ALL people to jointly improve and/or preserve the state of air quality where need be;
- For government to:
  - First know what we are managing (to measure is to know); and to
  - Assess the efficacy of our interventions and improve as necessary, among others.

Ambient air pollution



http://www.environment.scotland.gov.uk/get-informed/air/air-quality/

- Multiple sources of pollutions – low level and aloft
- **Multiple impacts** of pollutions – health, ecosystem (deposition), agriculture (ozone and SO_2), water, materials, visibility, climate.
- Indoor air pollution not shown here → potential for large health impact with domestic fuel use

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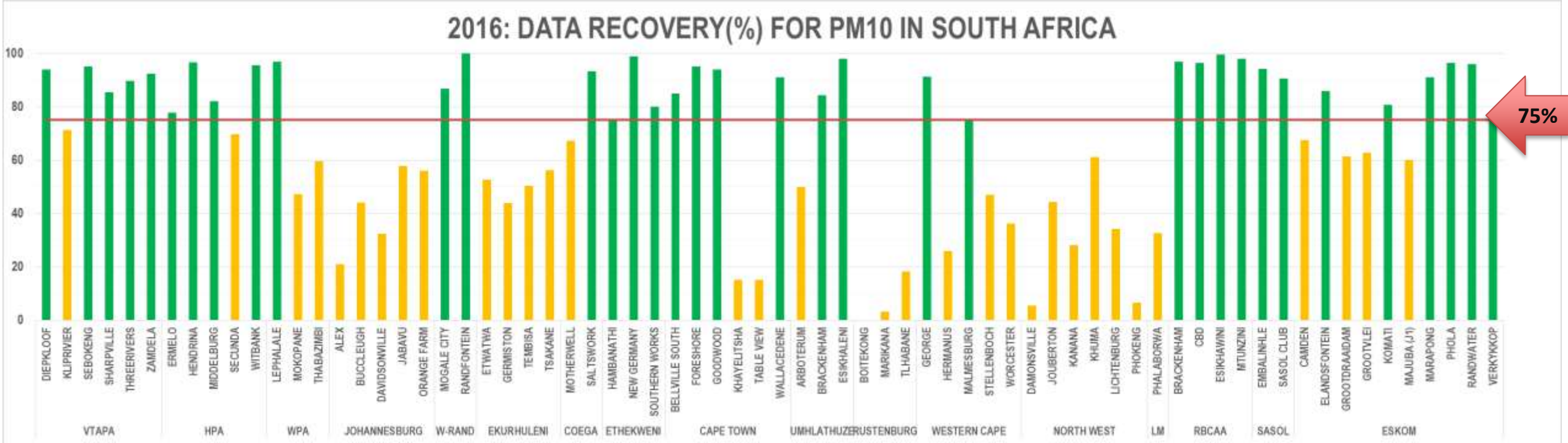
The 2017 State of Air Report Entails...

- Annual averages of PM_{10}, $PM_{2.5}$ and SO_2 data from 2005 to 2016
- The National Air Quality Indicator (measure of the efficacy of policy interventions)
- Data from some stations have been excluded due to low data recovery – in order to compare "apples with apples"

Monitoring Networks Included

- Cape Town
- eThekwini
- Johannesburg (Low data recovery)
- Ekurhuleni (Low data recovery)
- Tshwane (No data since 2015) - instruments were not serviced and calibrated since December 2014
- Vaal Triangle Priority Area
- Highveld Priority Area
- Waterberg Priority Area
- Provinces:
  - Western Cape
  - North West is excluded due to Low data recovery
  - KwaZulu-Natal (No data) since 2013
- Eskom, Sasol, COEGA and Richards Bay Clean Air Association


2016: DATA RECOVERY(%) FOR PM10 IN SOUTH AFRICA
100
80
60
40
20
0
75%
DIEPKLOOF
KLIPRIVIER
SEBOKENG
SHARPVILLE
THREERIVERS
ZAMDELA
ERMELO
HENDRINA
MIDDELBURG
SECUNDA
WITBANK
LEPHALALE
MOKOPANE
THABAZIMBI
ALEX
BUCCLEUGH
DAVIDSONVILLE
JABAVU
ORANGE FARM
MOGALE CITY
RANDFONTEIN
ETWATWA
GERMISTON
TEMBISA
TSAKANE
MOTHERWELL
SALTSWORK
HAMBANATHI
NEW GERMANY
SOUTHERN WORKS
BELLVILLE SOUTH
FORESHORE
GOODWOOD
KHAYELITSHA
TABLE VIEW
WALLACEDENE
ARBOTERUM
BRACKENHAM
ESIKHALENI
BOITEKONG
MARIKANA
TLHABANE
GEORGE
HERMANUS
MALMESBURG
STELLENBOCH
WORCESTER
DAMONSVILLE
JOUBERTON
KANANA
KHUMA
LICHTENBURG
PHOKENG
PHALABORWA
BRACKENHAM
CBD
ESIKHAWINI
MTUNZINI
EMBALINHLE
SASOL CLUB
CAMDEN
ELANDSFONTEIN
GROOTDRAADAM
GROOTVLEI
KOMATI
MAJUBA (J1)
MARAPONG
PHOLA
RANDWATER
VERKYKKOP
VTAPA
HPA
WPA
JOHANNESBURG
W-RAND
EKURHULENI
COEGA
ETHEKWENI
CAPE TOWN
UMHLATHUZE
RUSTENBURG
WESTERN CAPE
NORTH WEST
LM
RBCAA
SASOL
ESKOM

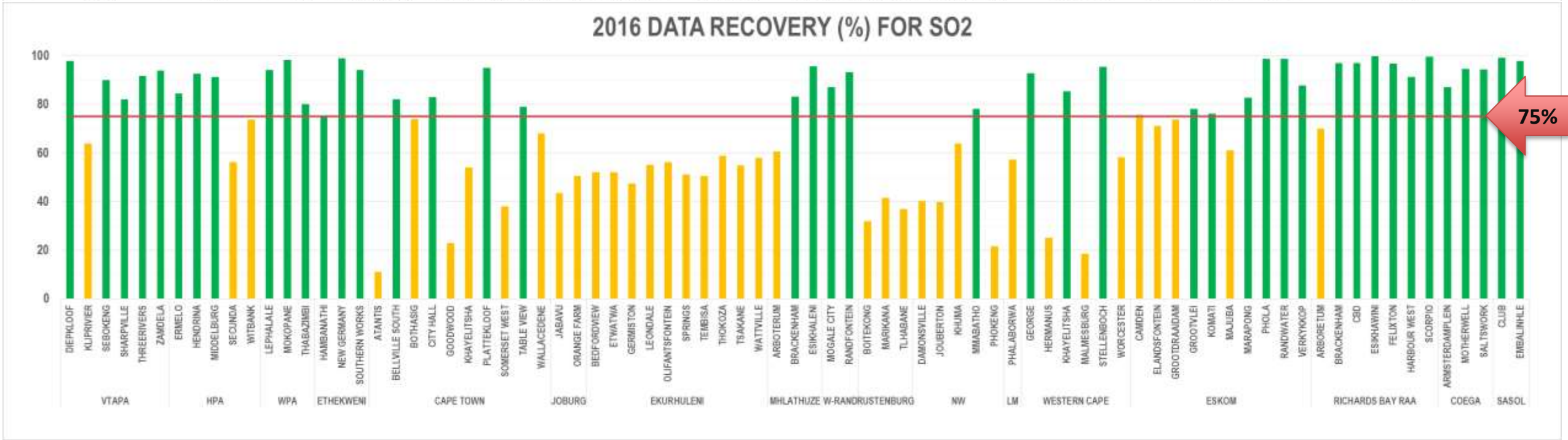

2016 DATA RECOVERY (%) FOR SO2
100
80
60
40
20
0
75%
DIEPKLOOF
KLIPRIVIER
SEBOKENG
SHARPVILLE
THREERIVERS
ZAMDELA
ERMELO
HENDRINA
MIDDELBURG
SECUNDA
WITBANK
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TABLE VIEW
WALLACEDENE
JABAVU
ORANGE FARM
BEDFORDVIEW
ETWATWA
GERMISTON
LEONDALE
OLIFANTSFONTEIN
SPRINGS
TEMBISA
THOKOZA
TSAKANE
WATTVILLE
ARBOTERUM
BRACKENHAM
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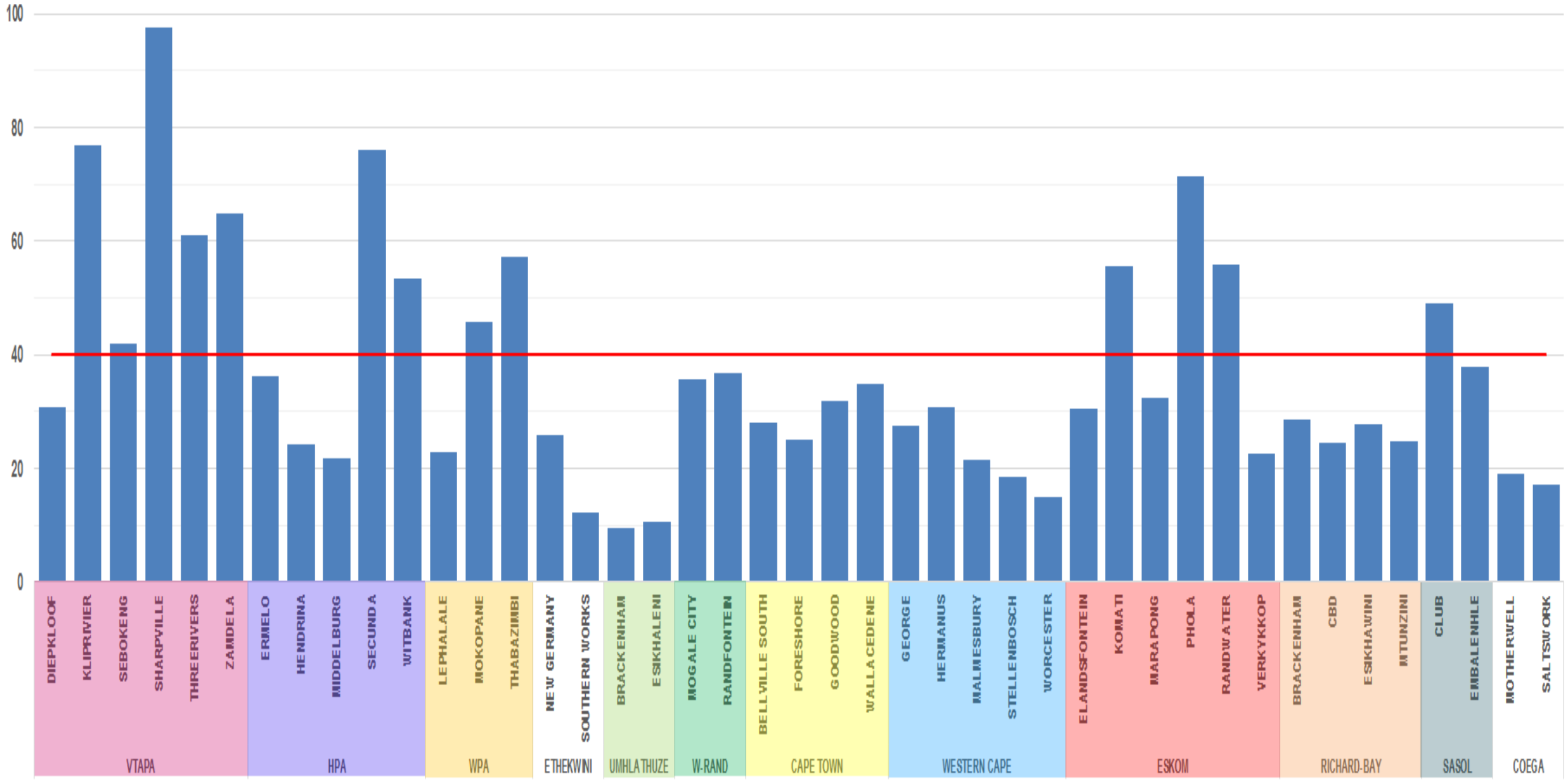
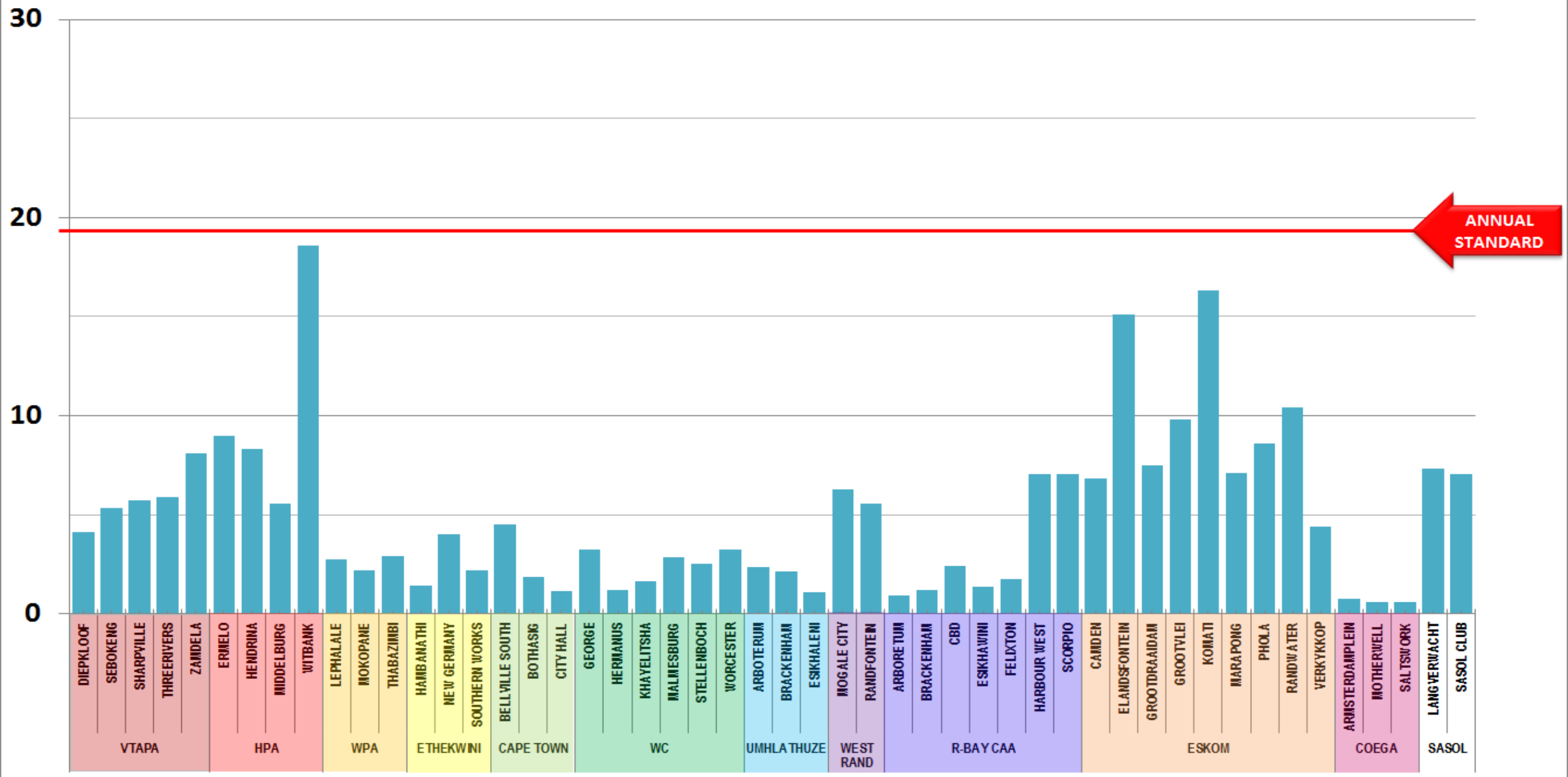
FELIXTON
HARBOUR WEST
SCORPIO
ARMSTERDAMPLEIN
MOTHERWELL
SALTSWORK
CLUB
EMBALINHLE
VTAPA
HPA
WPA
ETHEKWENI
CAPE TOWN
JOBURG
EKURHULENI
MHLATHUZE
W-RAND
RUSTENBURG
NW
LM
WESTERN CAPE
ESKOM
RICHARDS BAY RAA
COEGA
SASOL

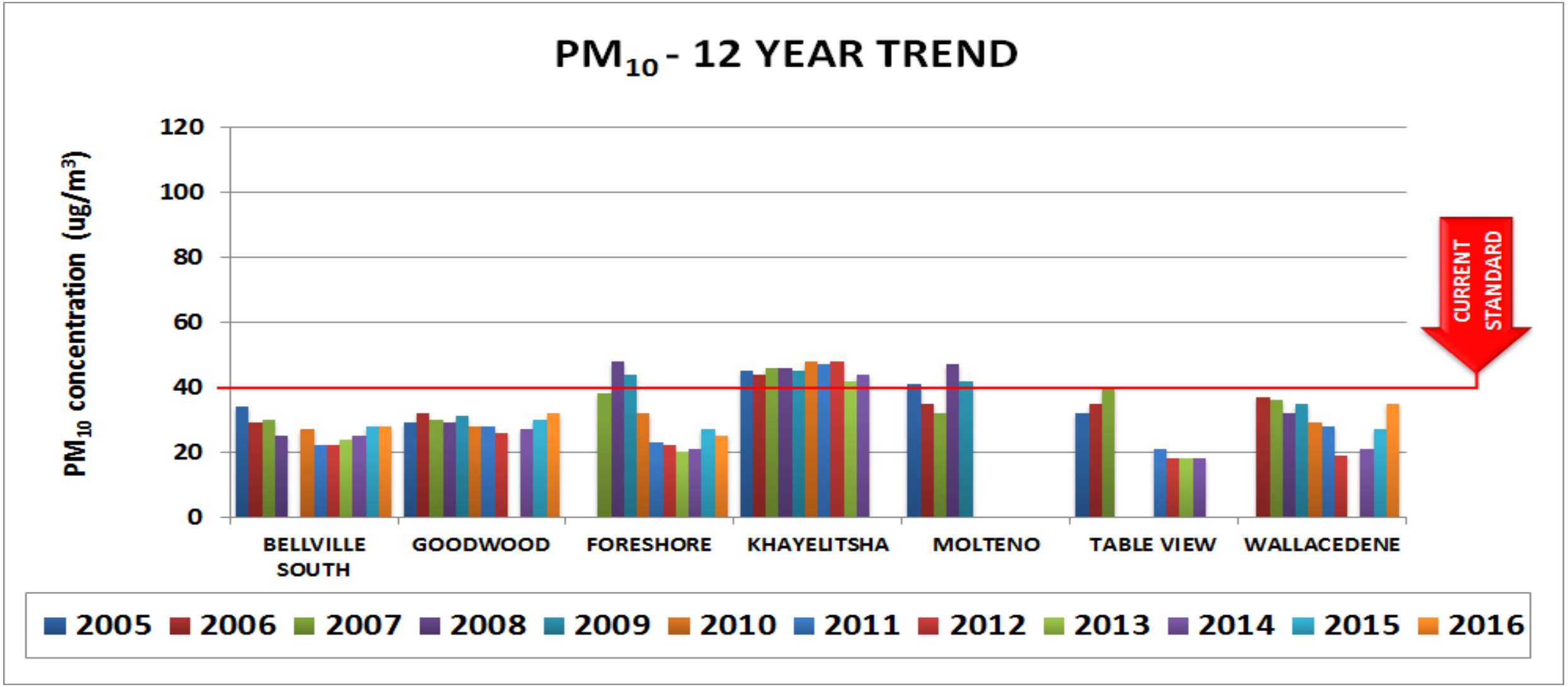
2016: PM10 Annual Averages (ug/m3)



2016: SO2 Annual Averages (ppb)



Cape Town



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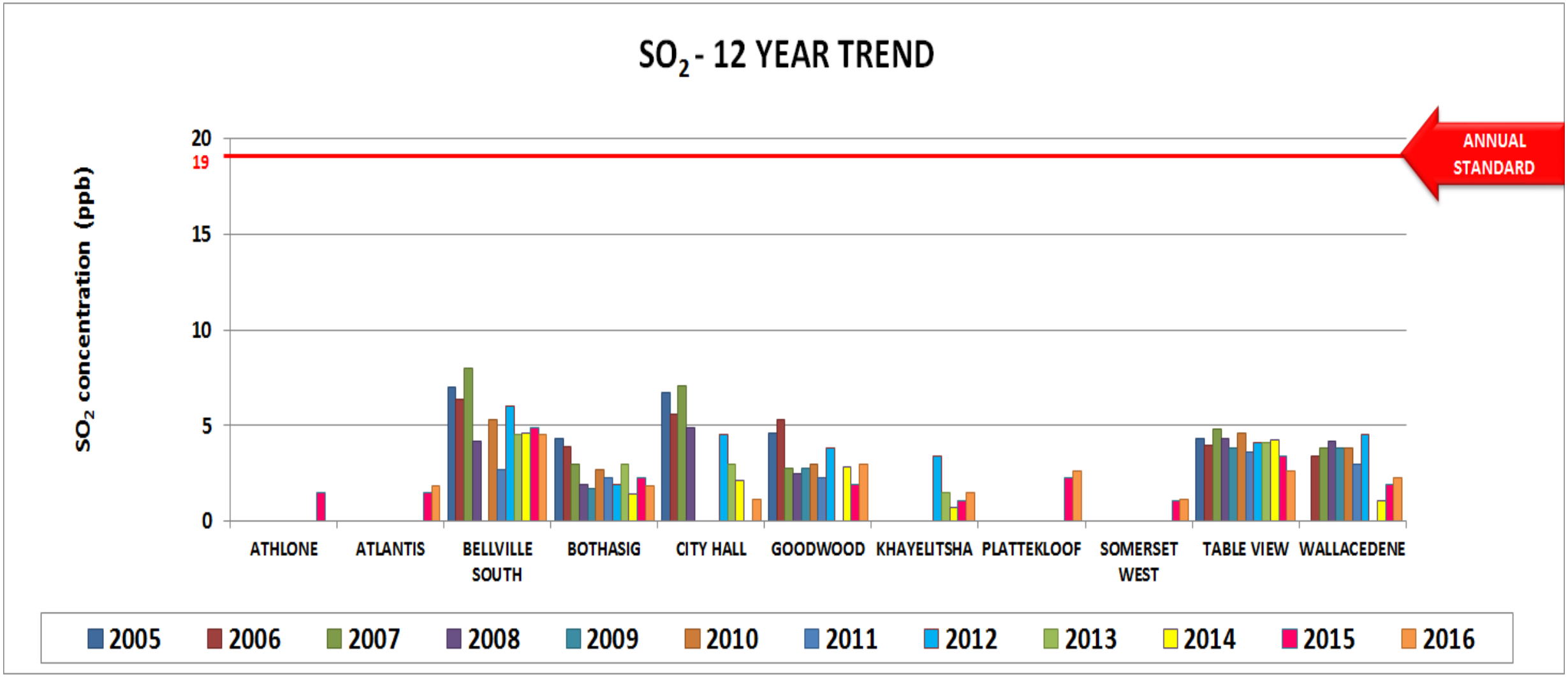
Cape Town



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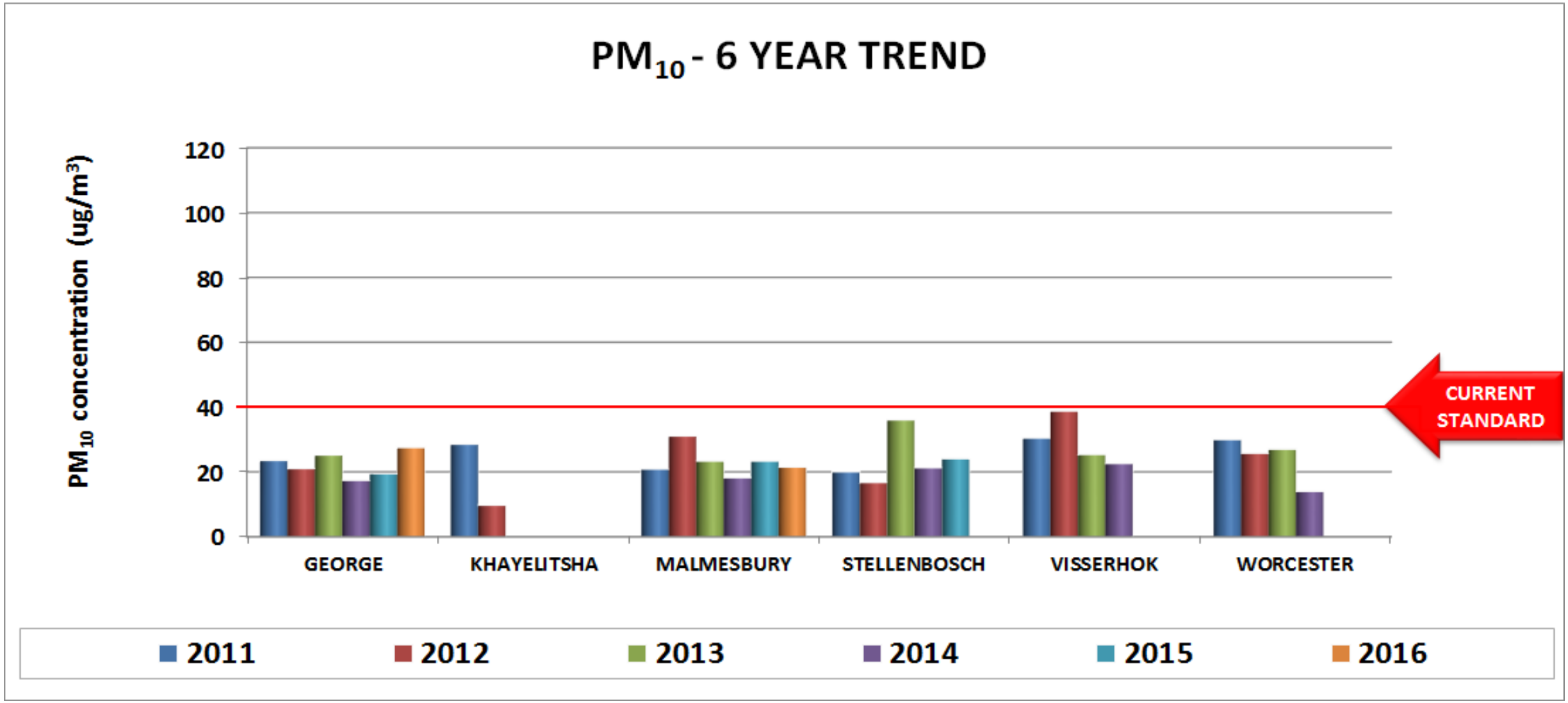
Western Cape



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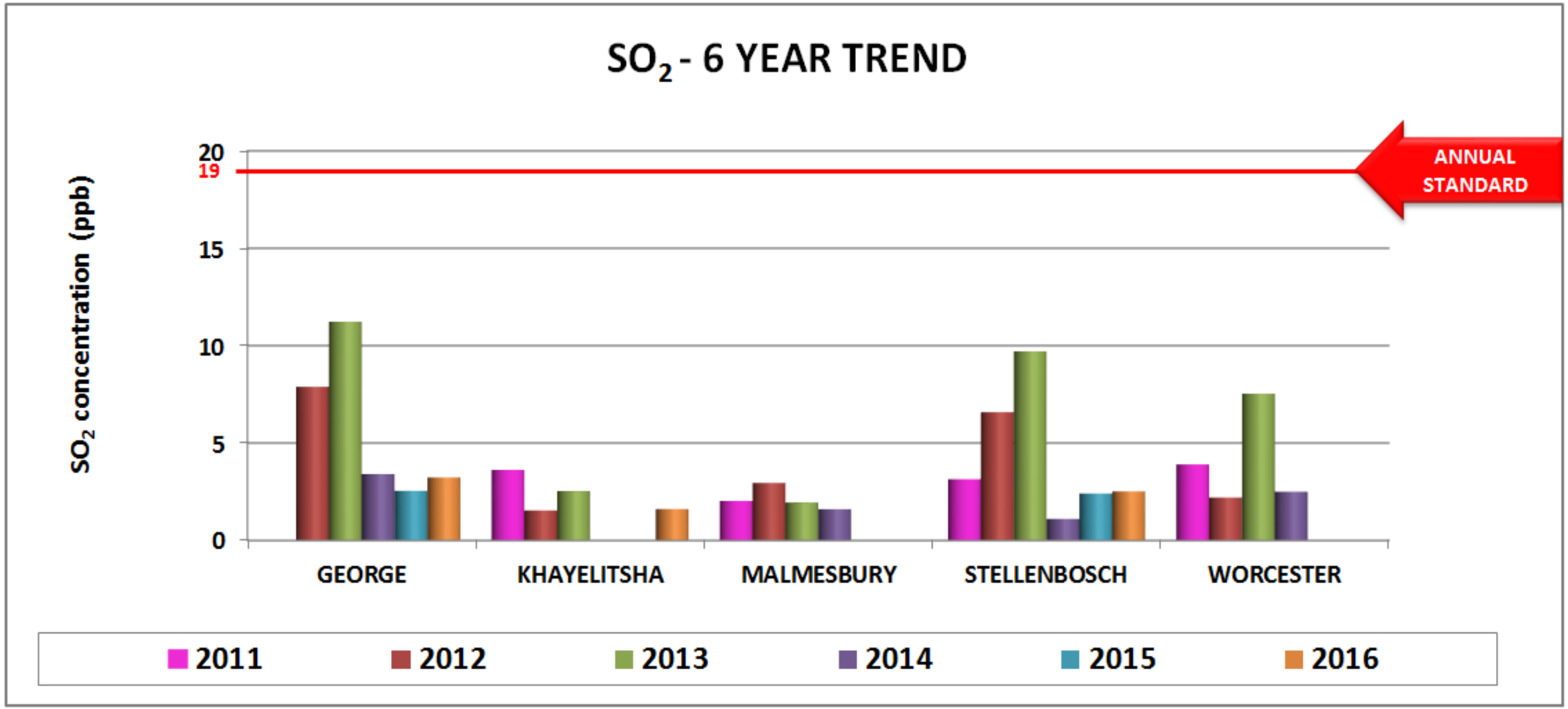
Western Cape



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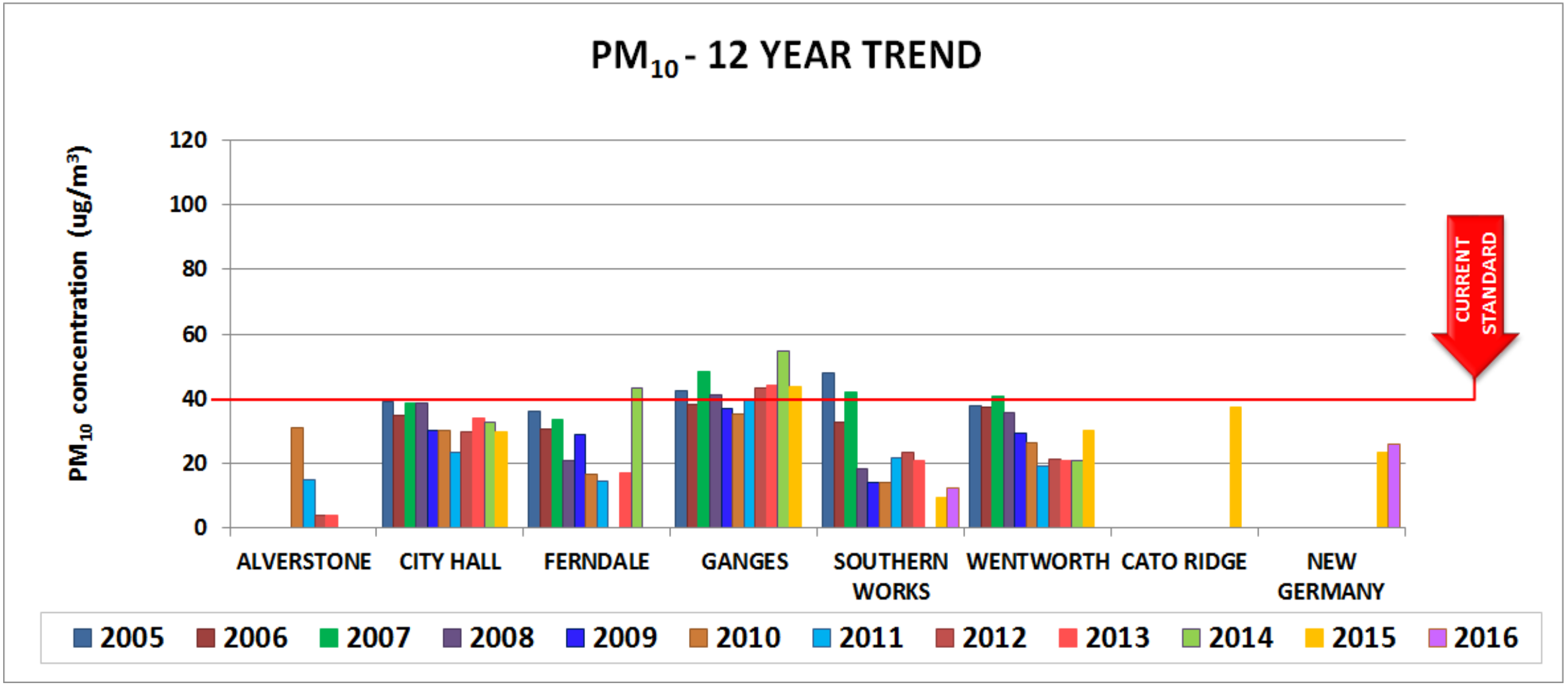
eThekwini



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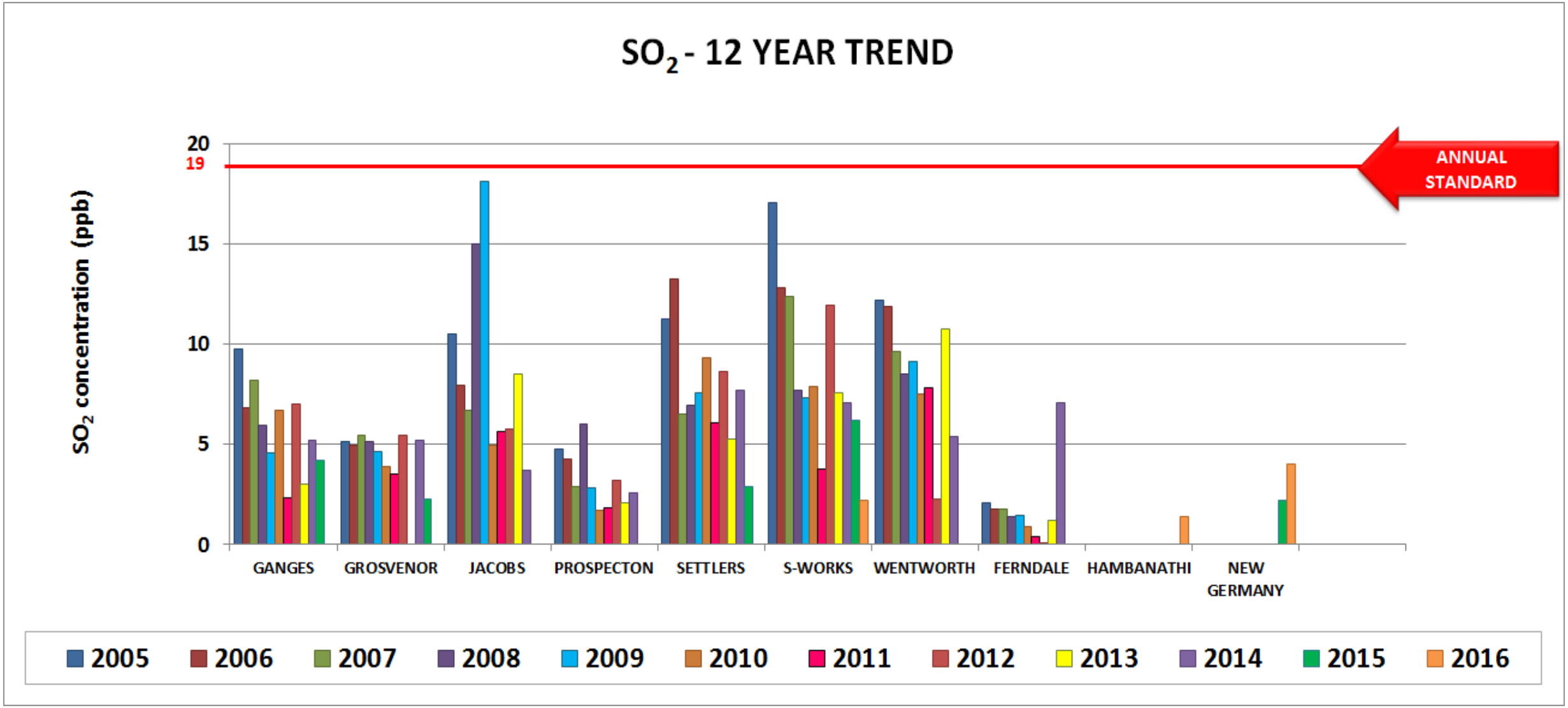
eThekwini



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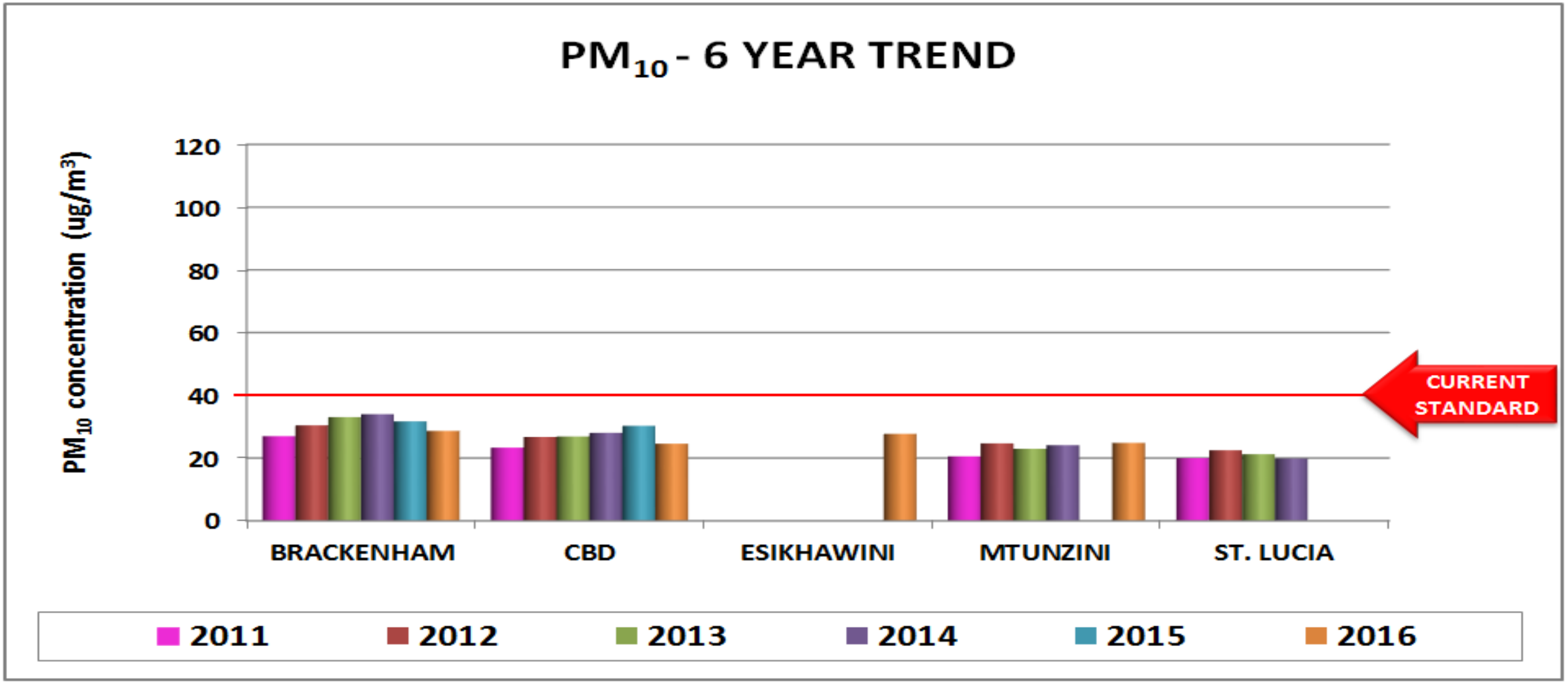
Richards Bay Clean Air Association



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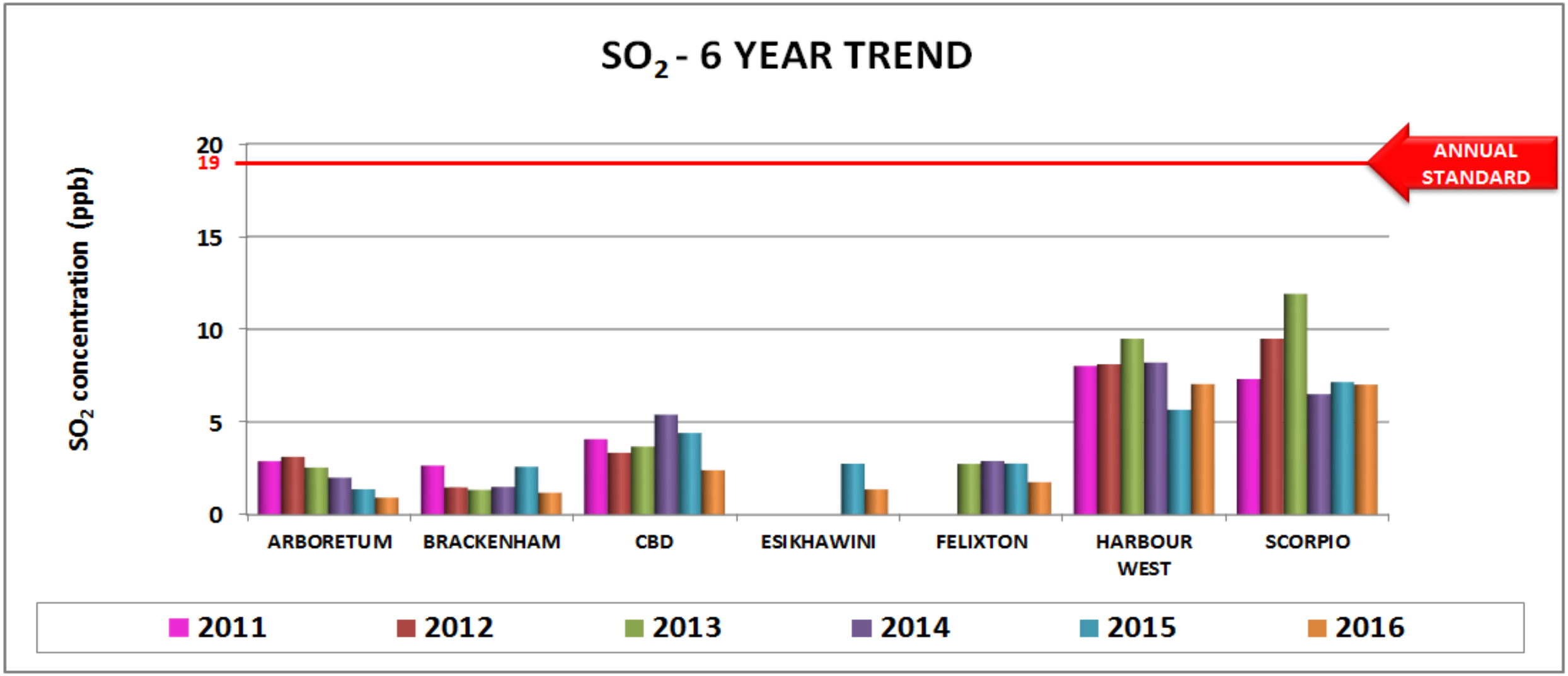

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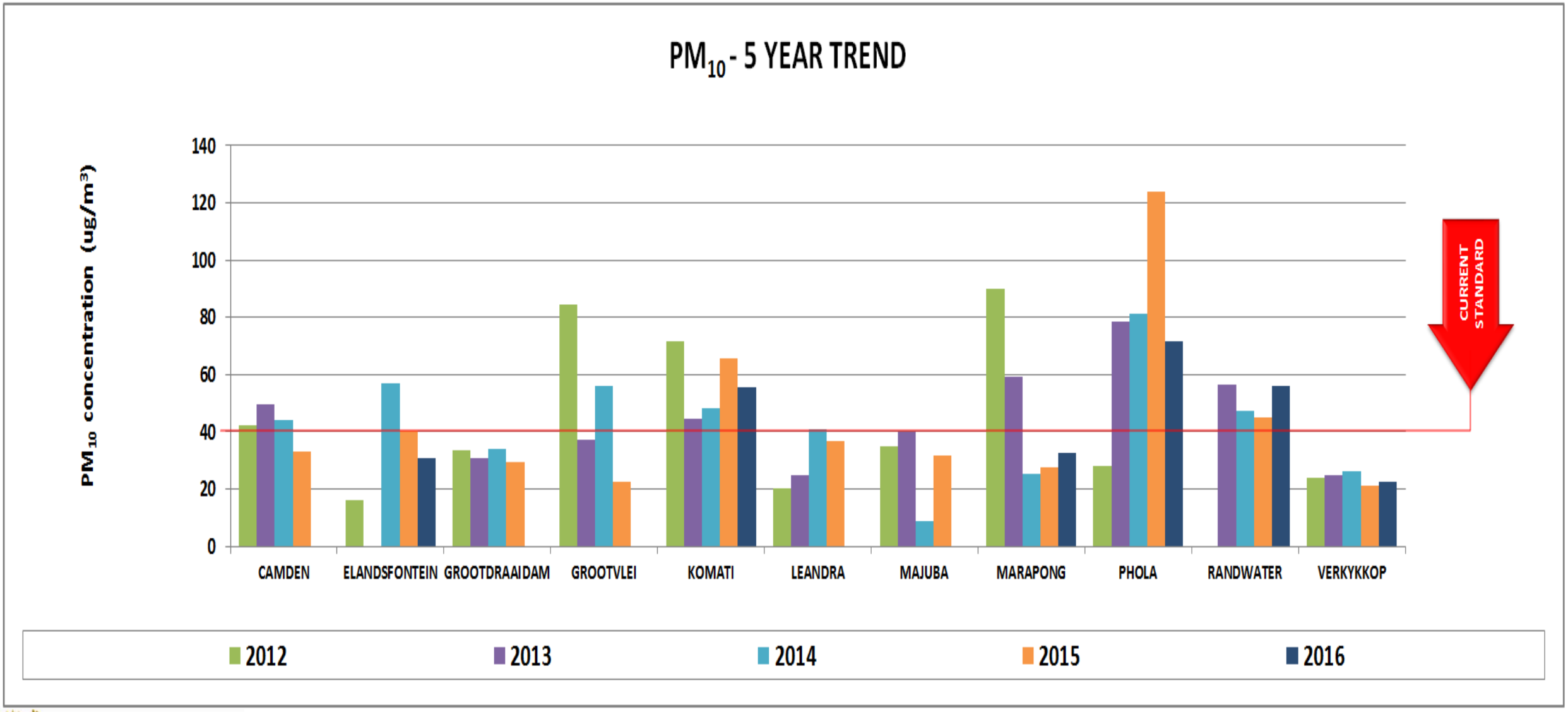
Eskom



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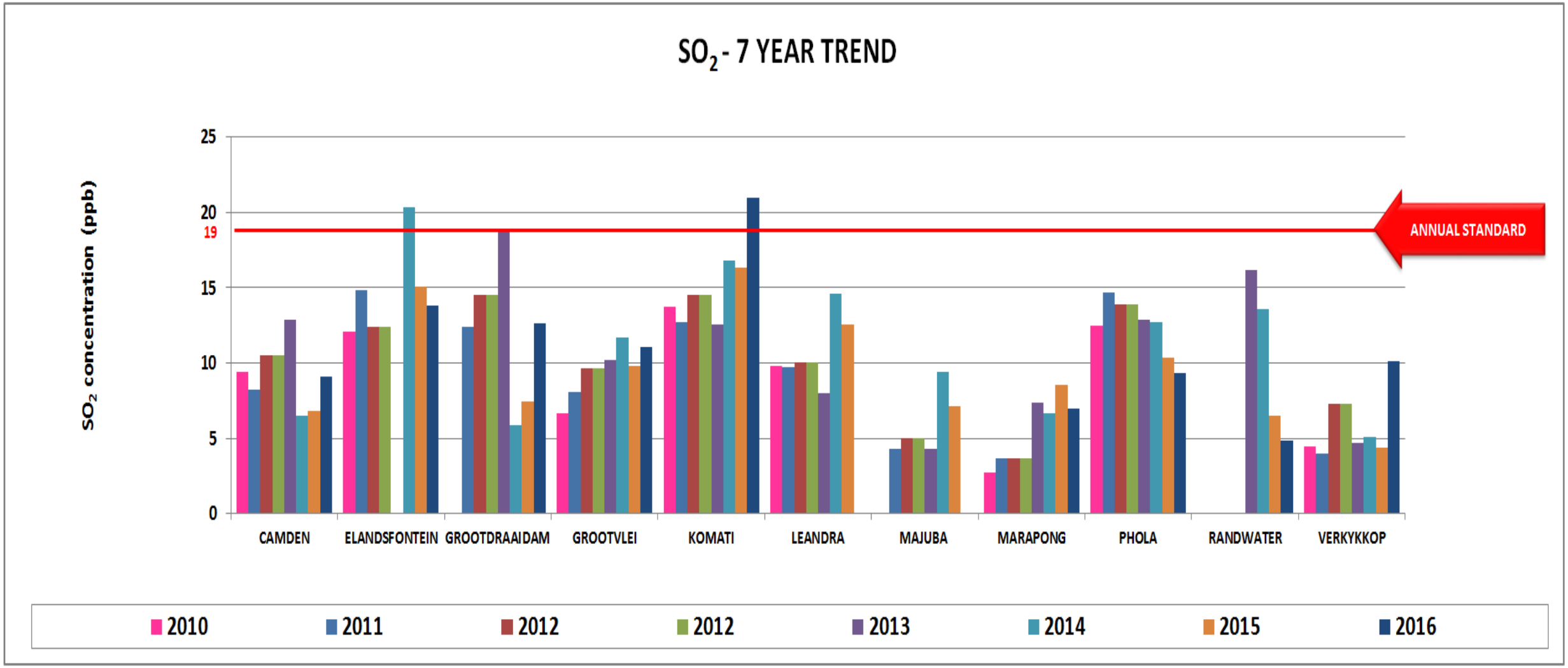
Eskom



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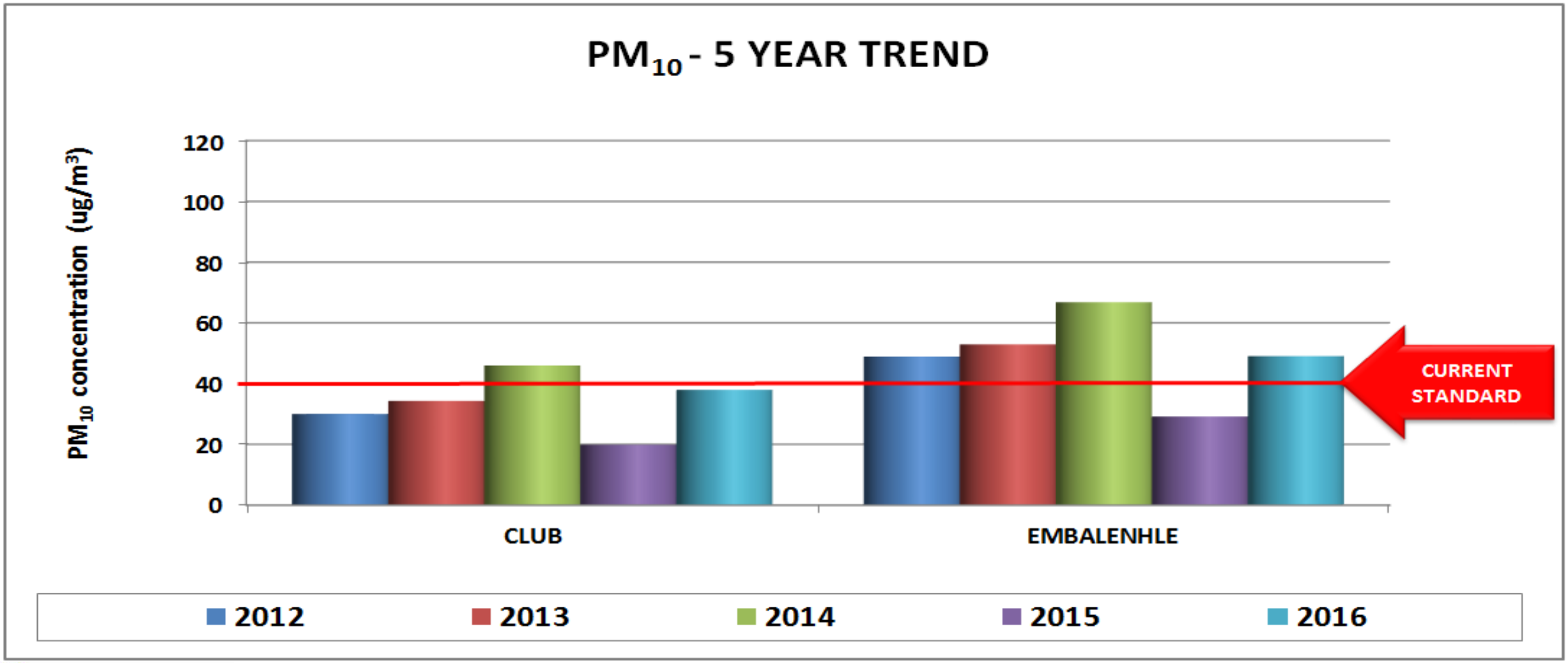
Sasol



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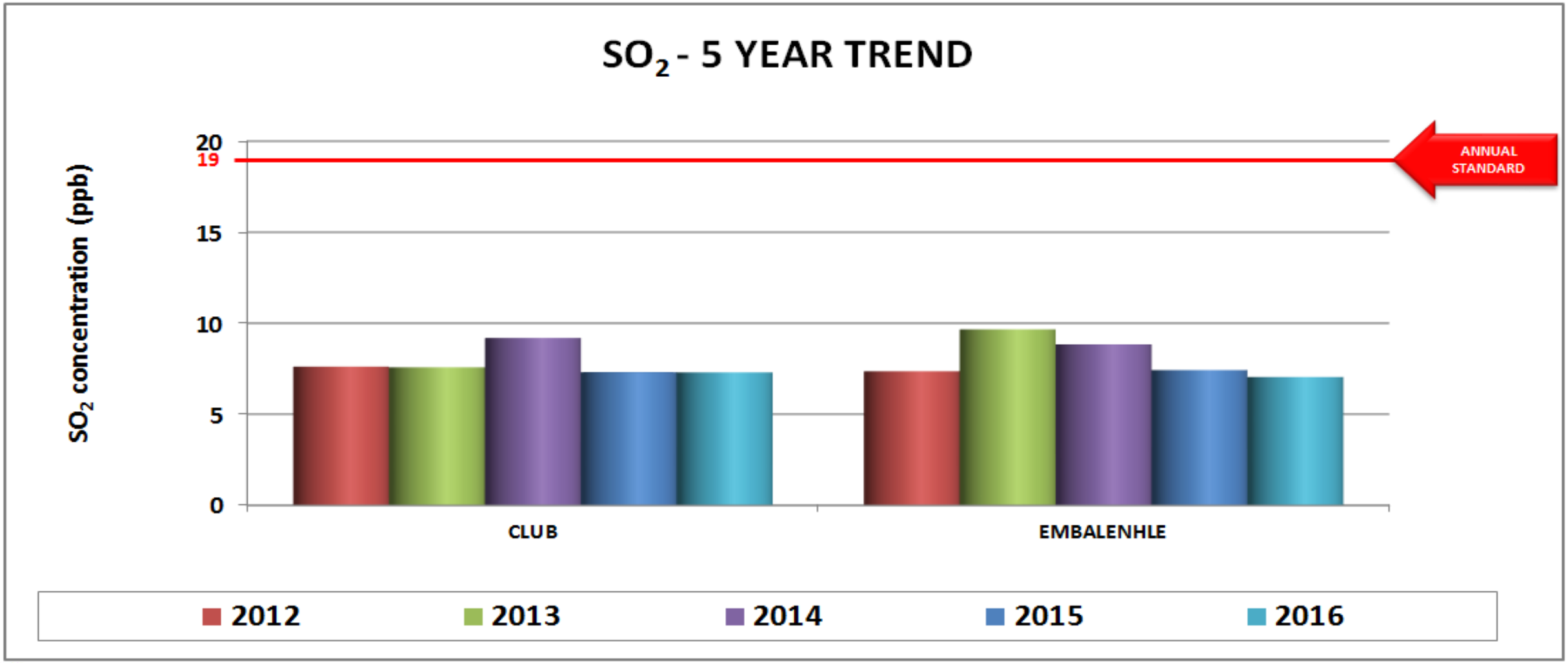

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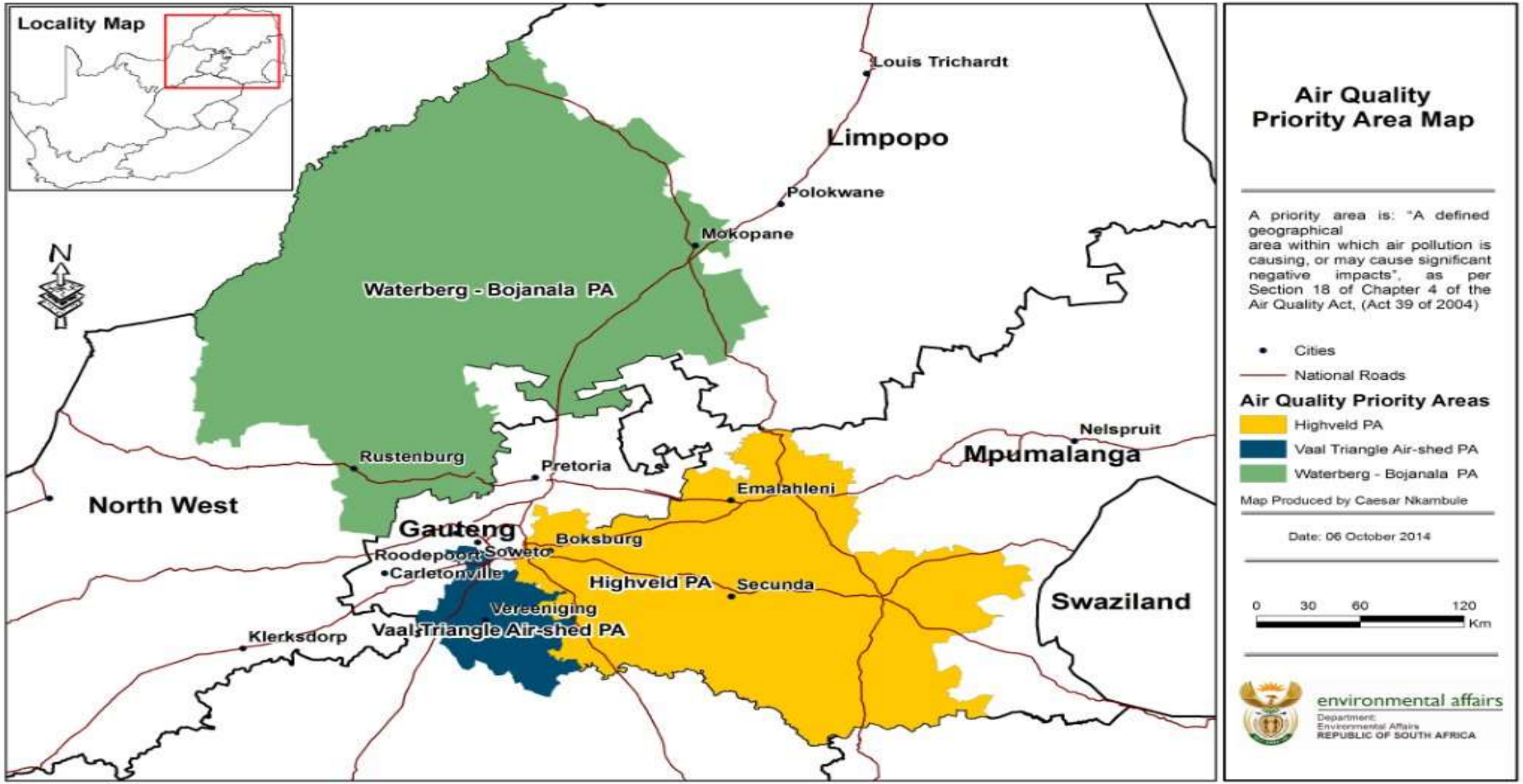
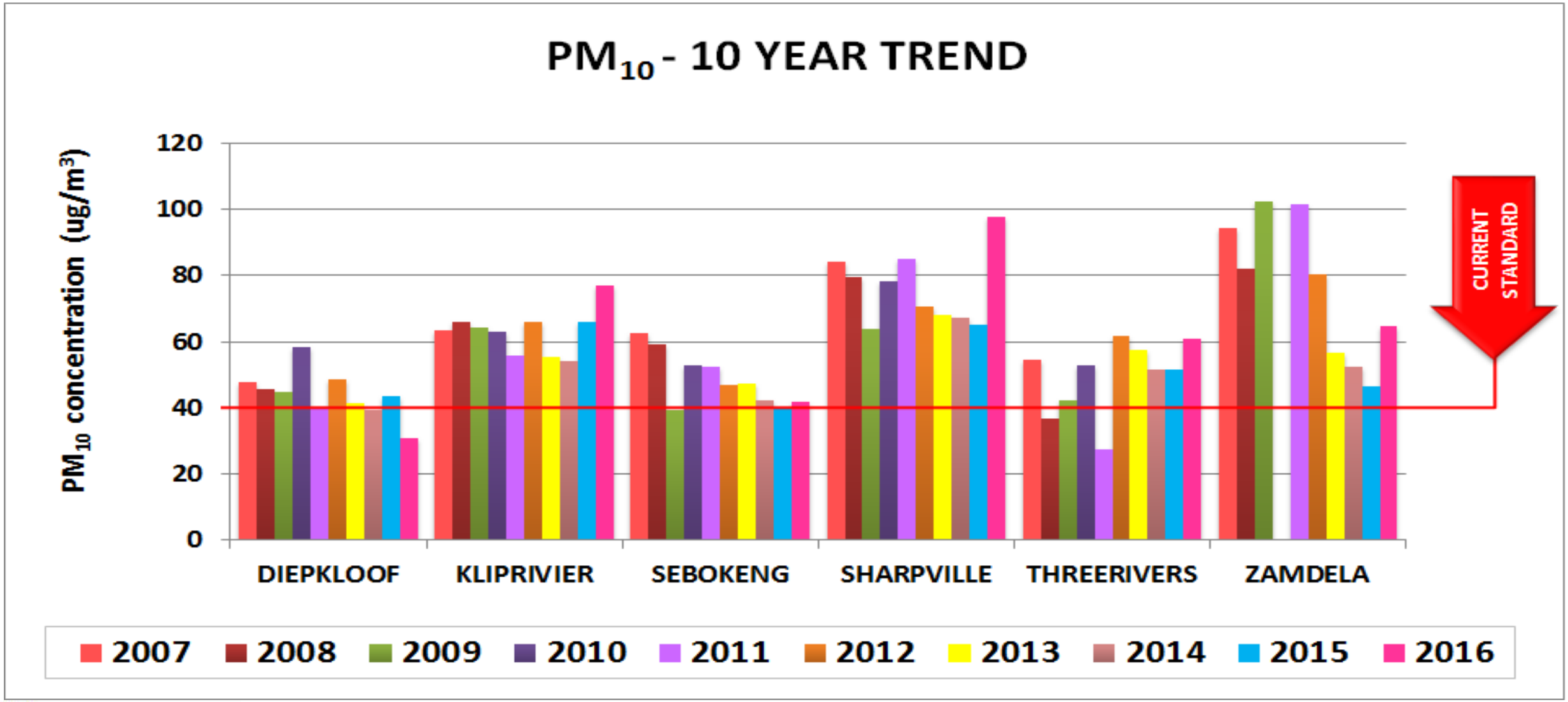
Declared Priority Area Networks

A Map of the National Priority Areas



Vaal Triangle Priority Area



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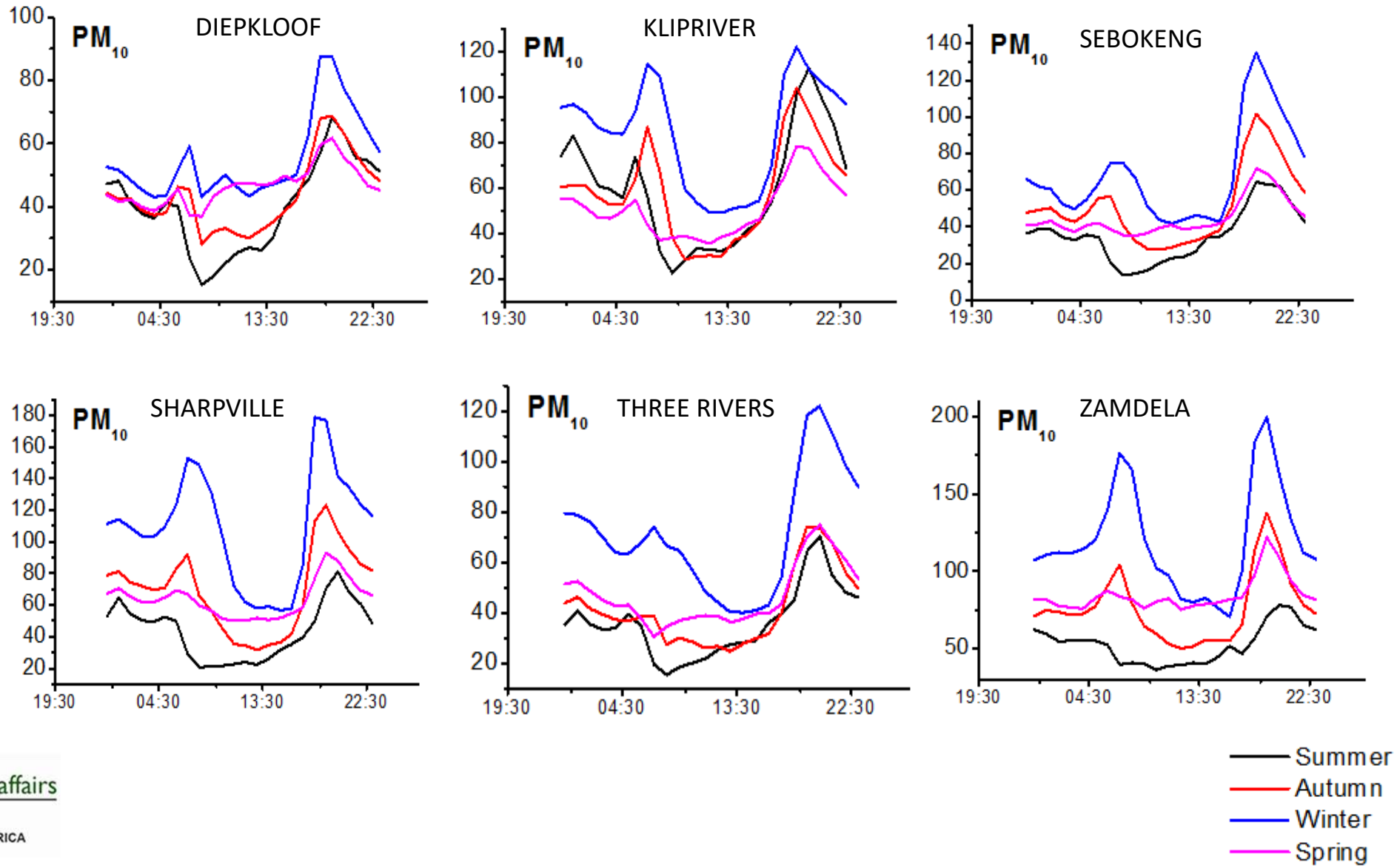
VTAPA PM_{10} Seasonal Cycles



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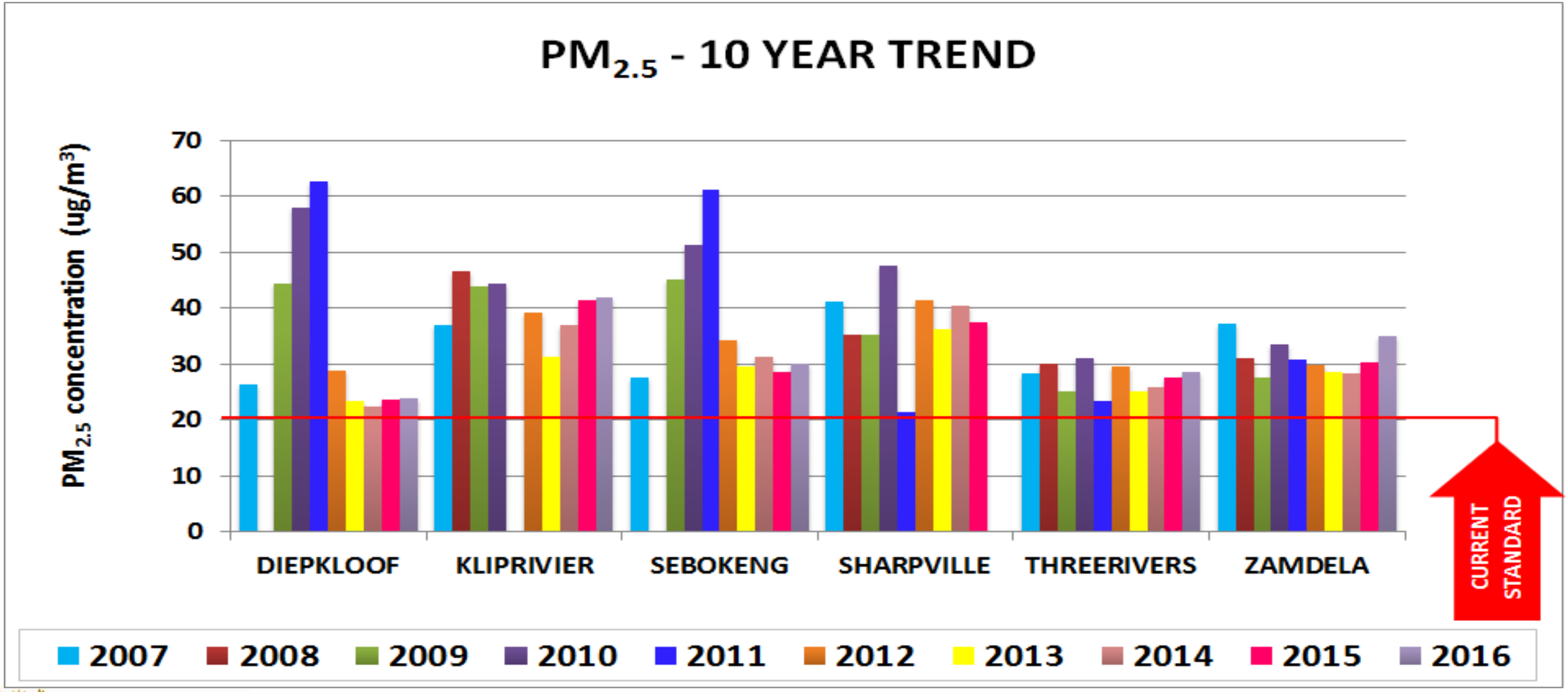
Vaal Triangle Priority Area



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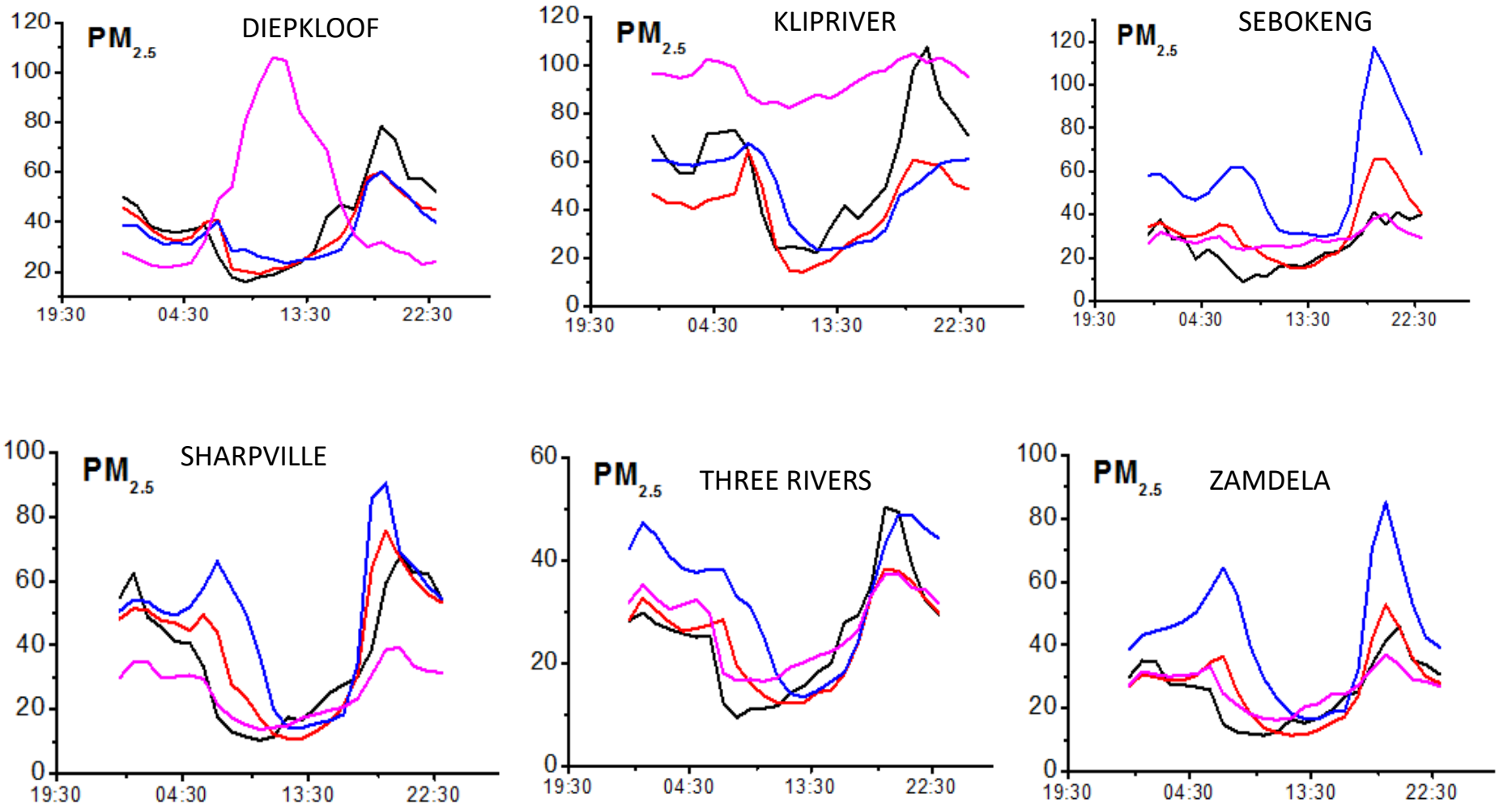
VTAPA $PM_{2.5}$ Seasonal Cycles



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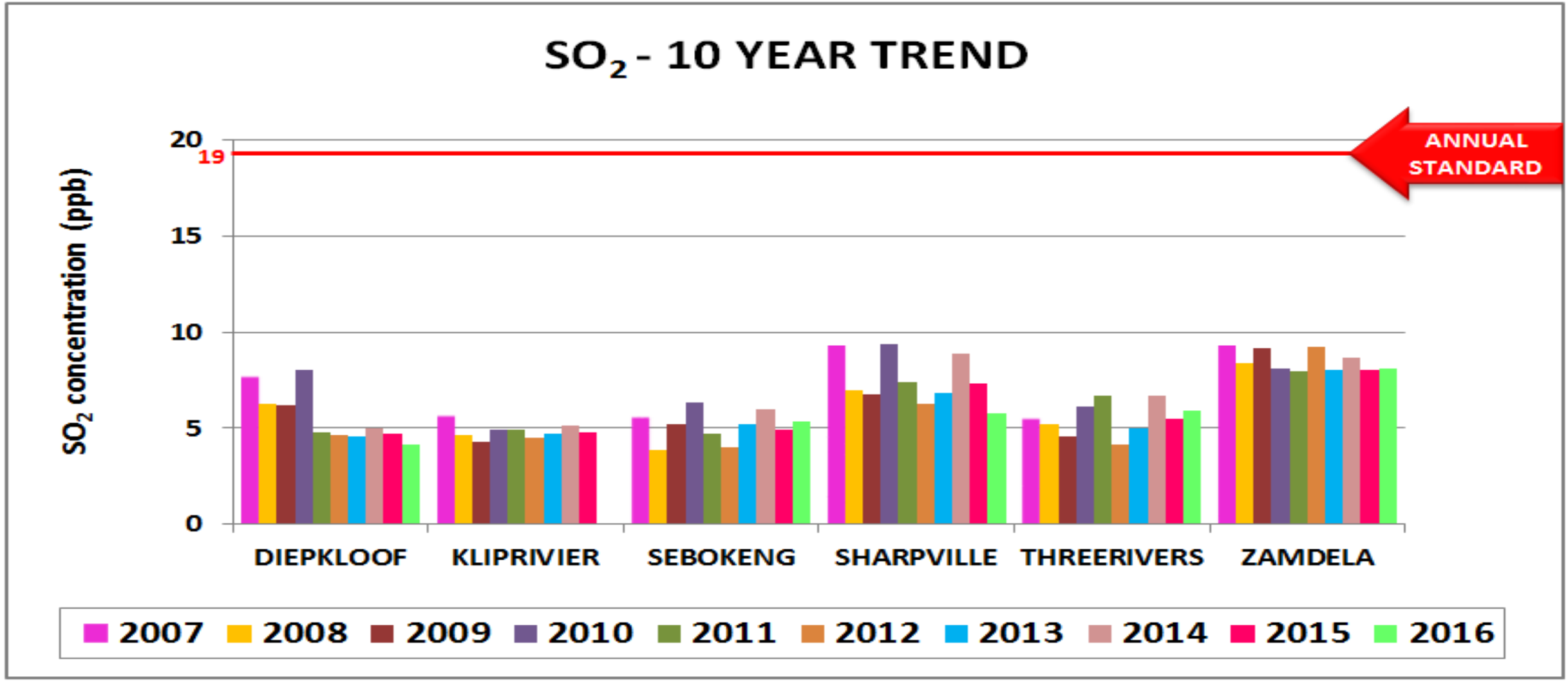
Vaal Triangle Priority Area



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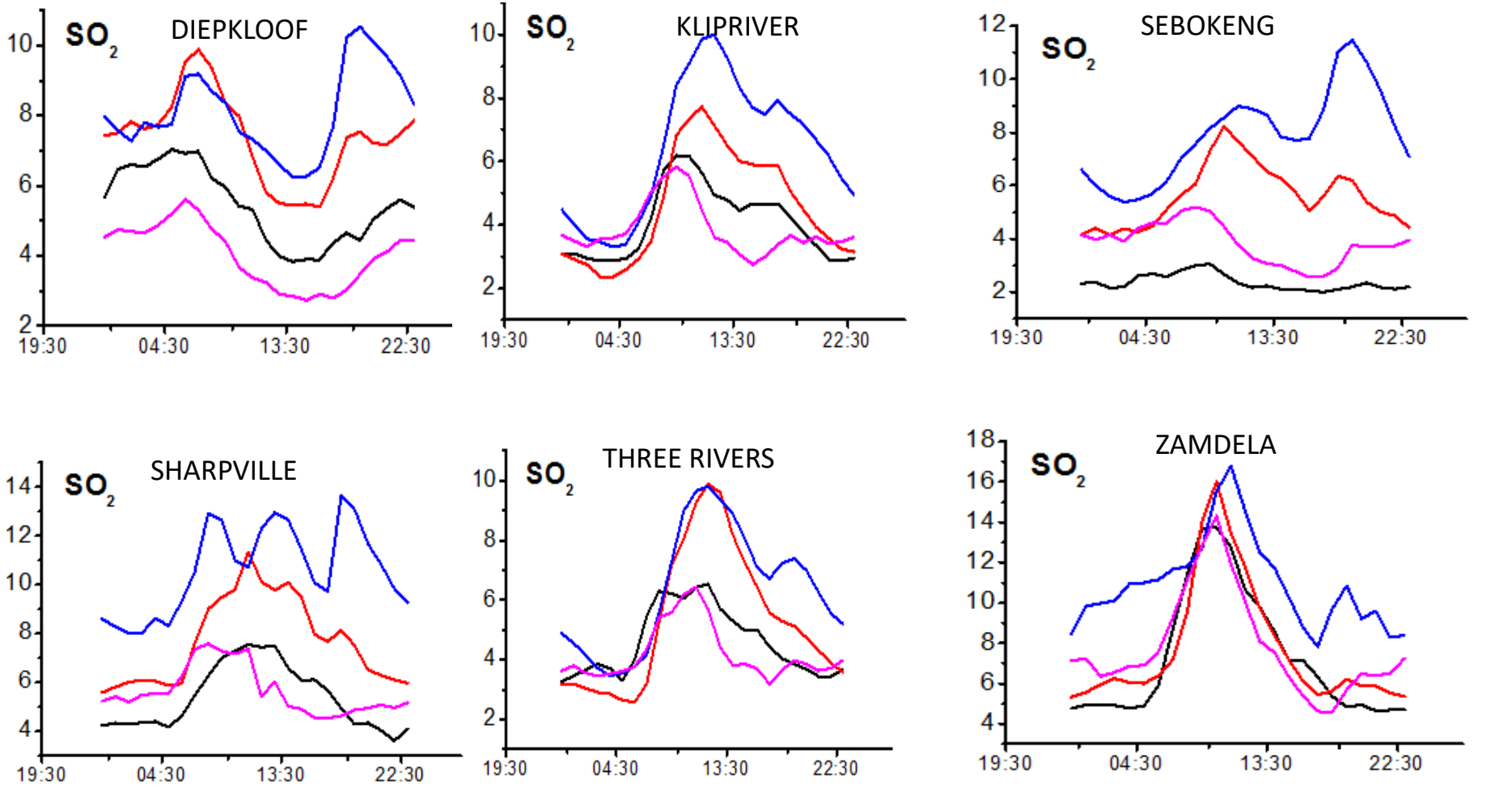
VTAPA SO_2 Seasonal Cycles



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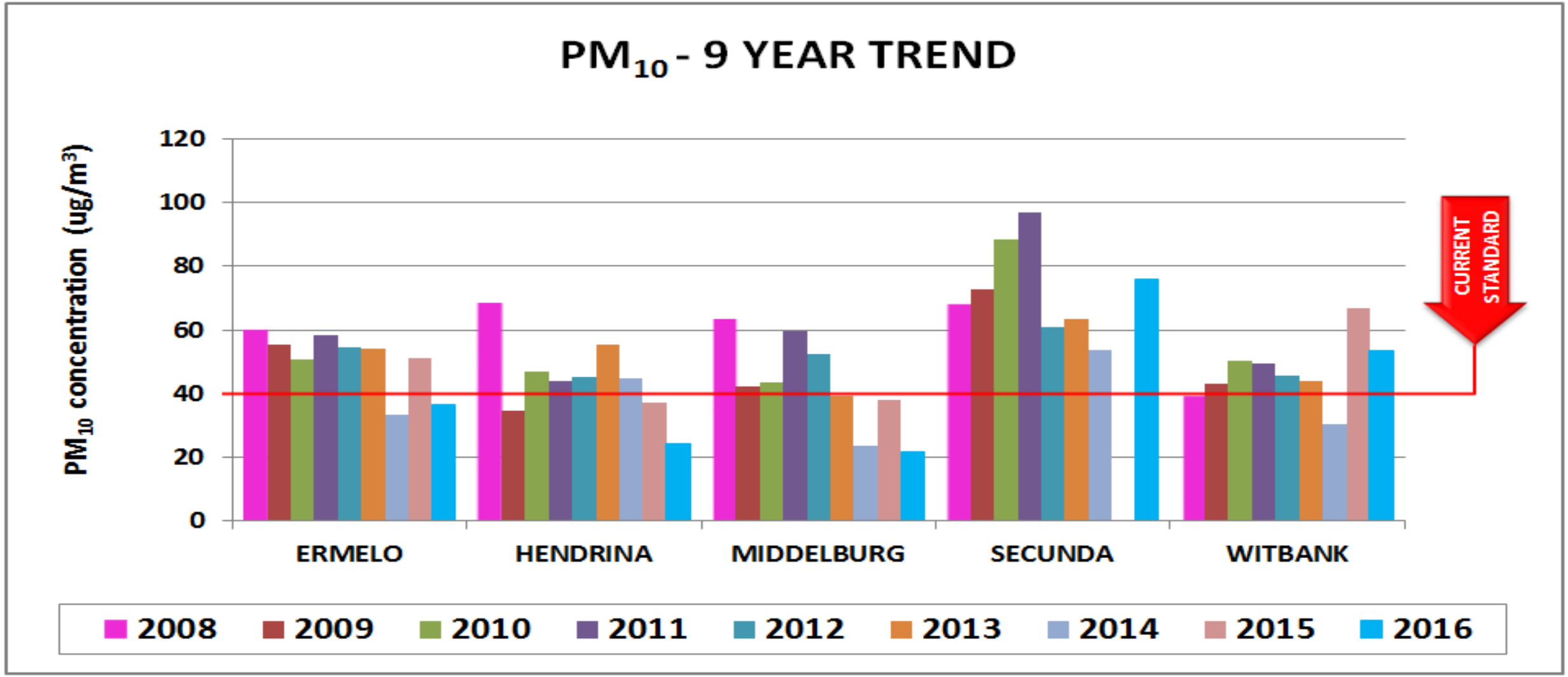
Highveld Priority Area



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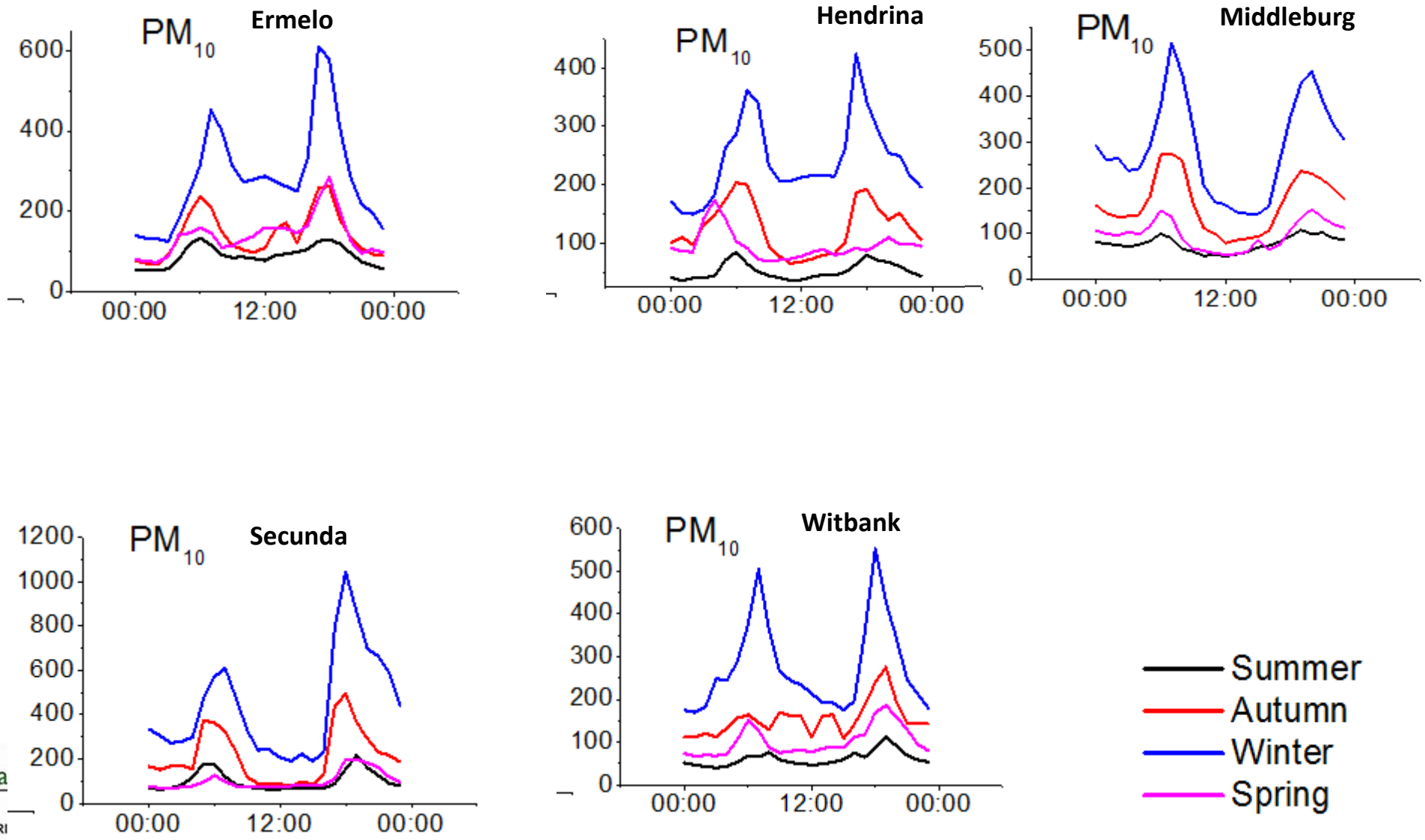
HPA PM_{10} seasonal variations



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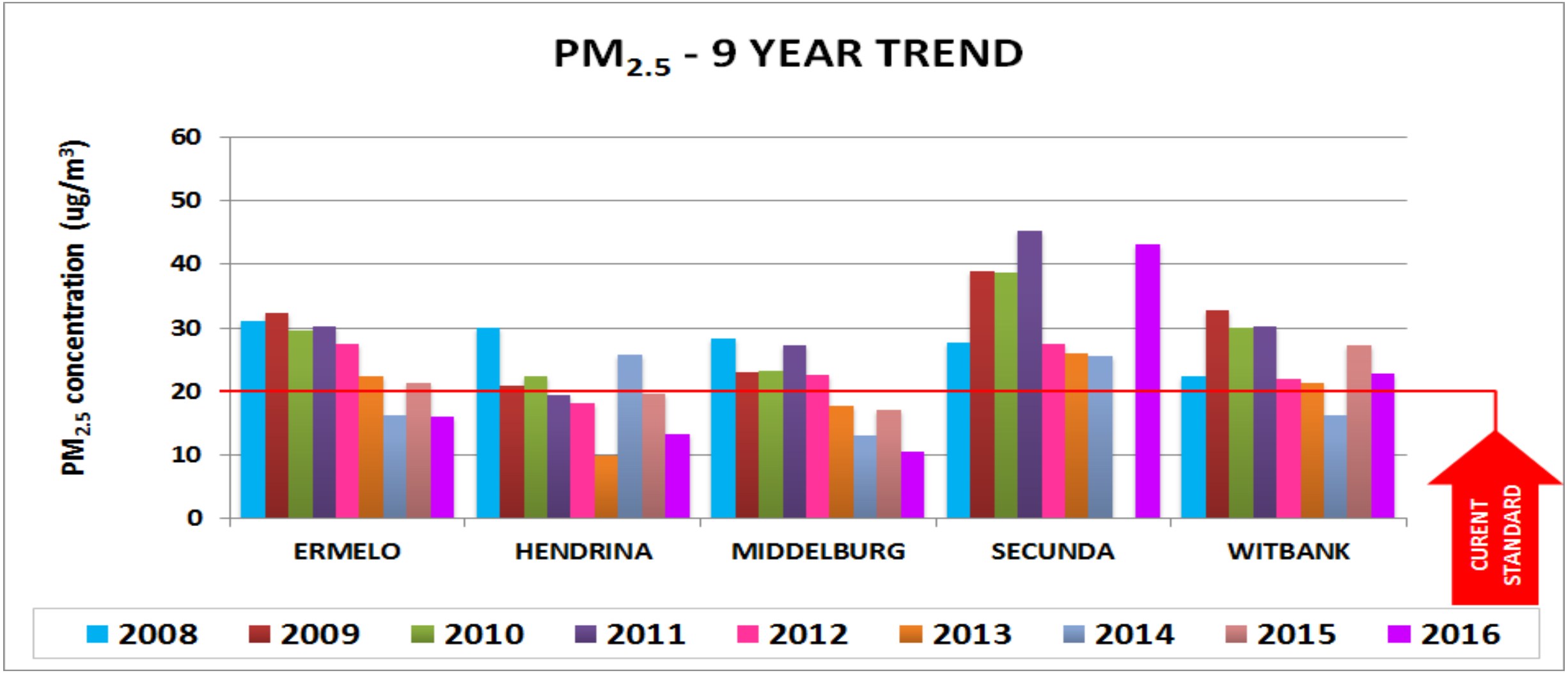
Highveld Priority Area



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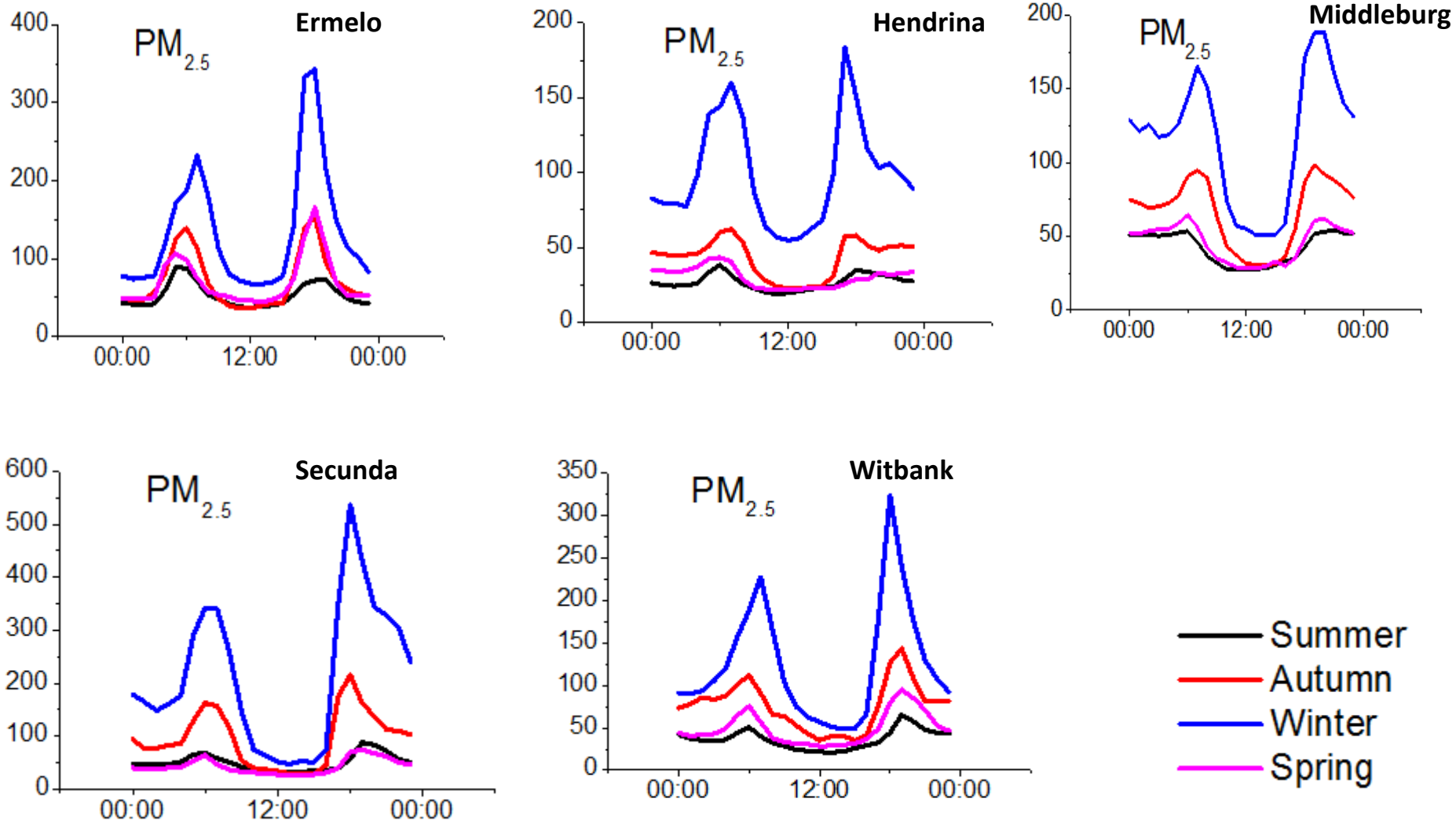
HPA $PM_{2.5}$ seasonal variations



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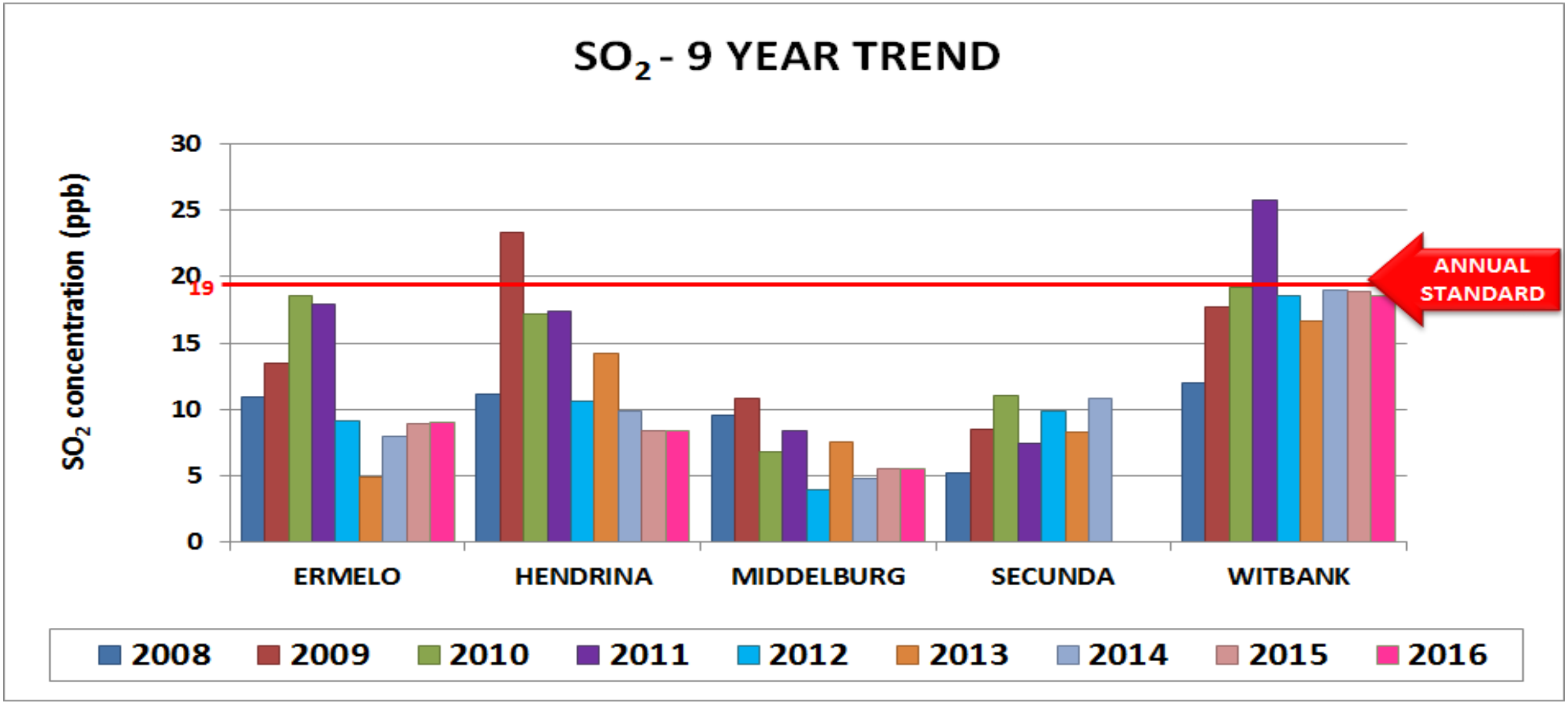
Highveld Priority Area



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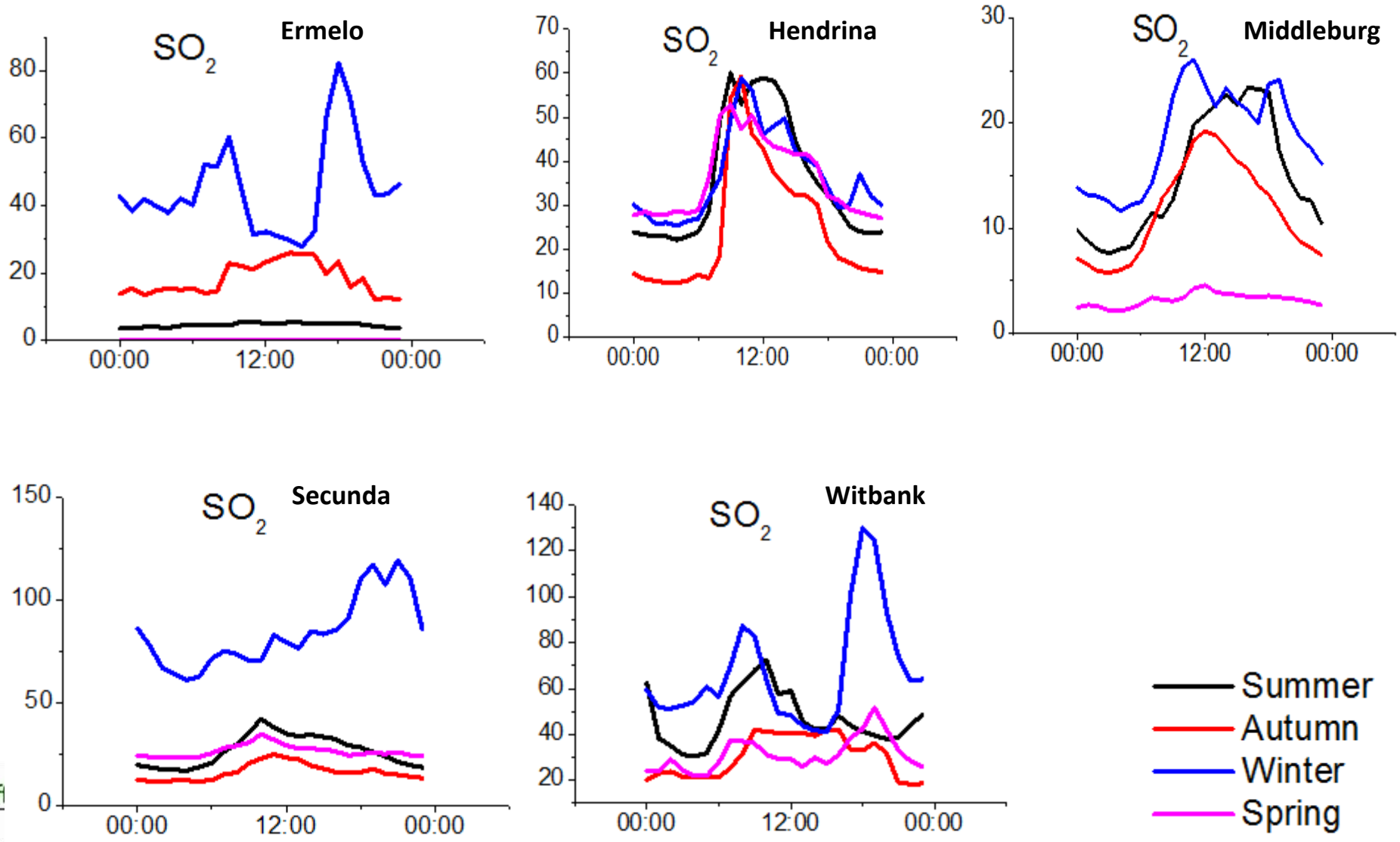
HPA SO_2 seasonal variations



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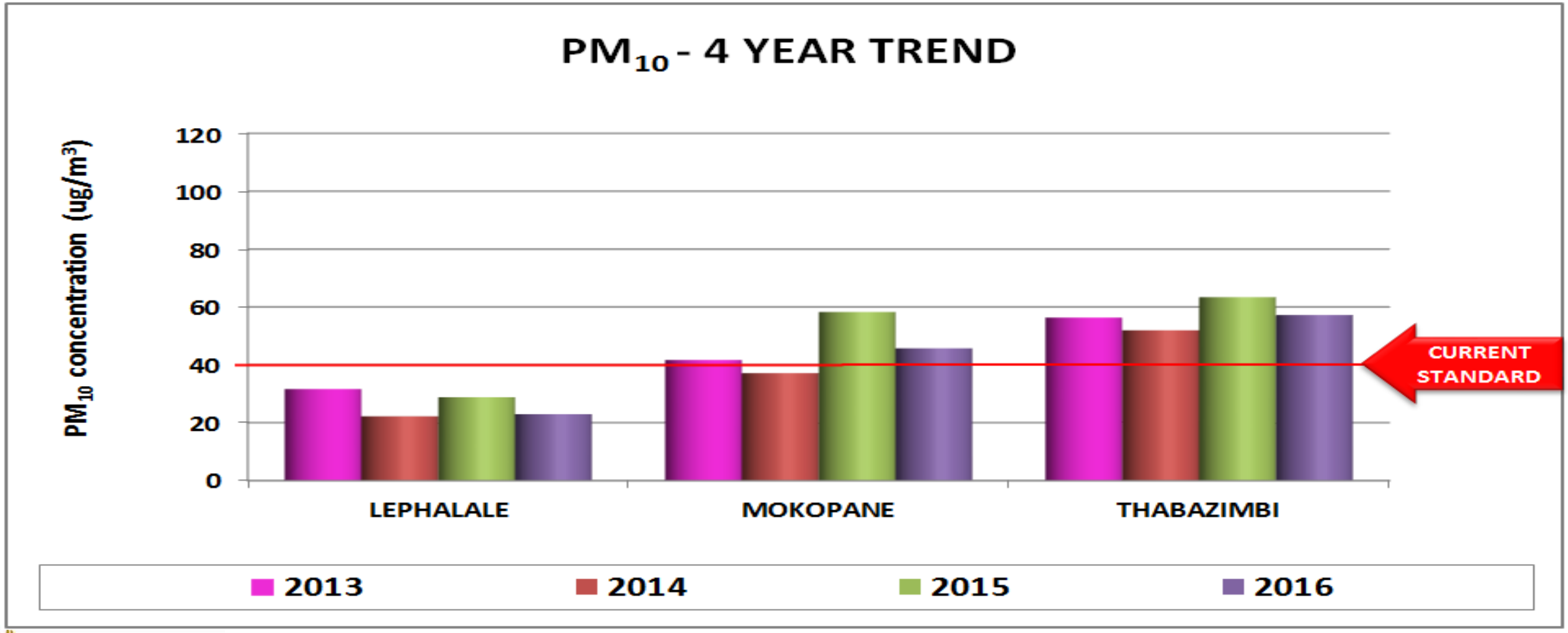
Waterberg Priority Area



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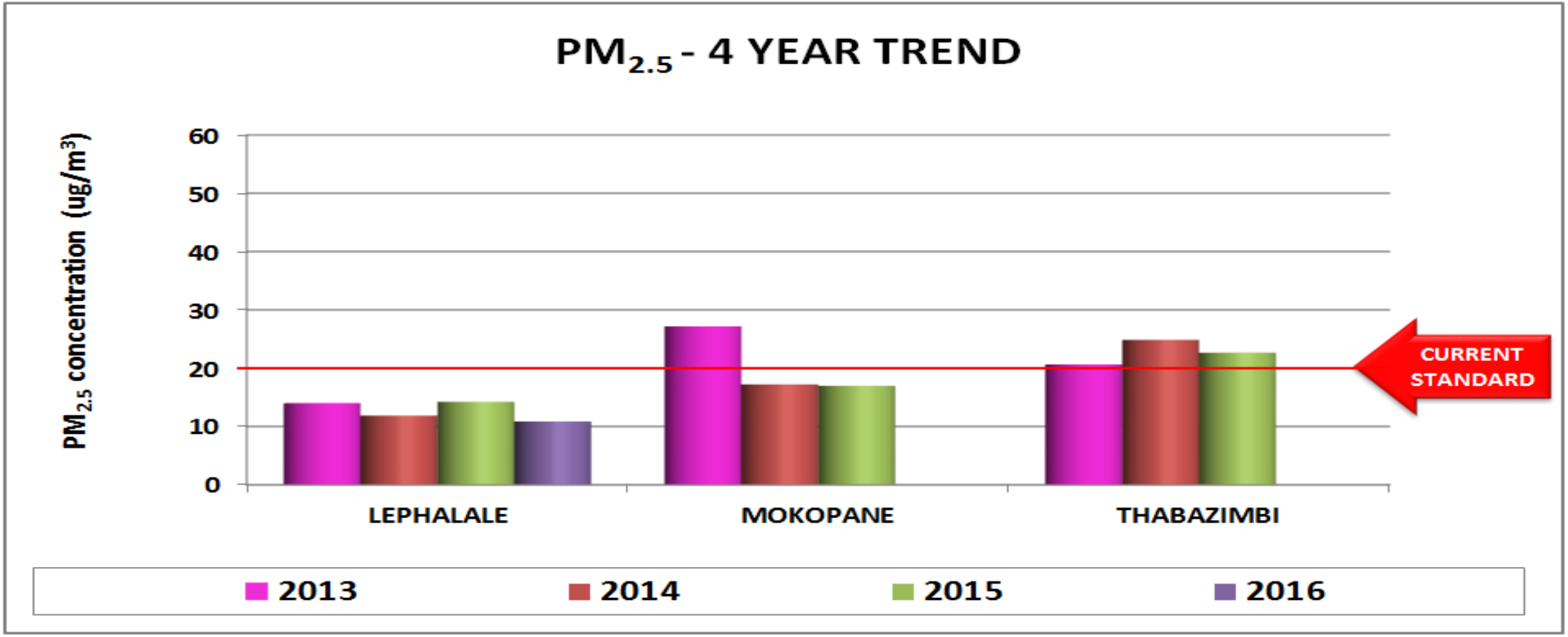
Waterberg Priority Area



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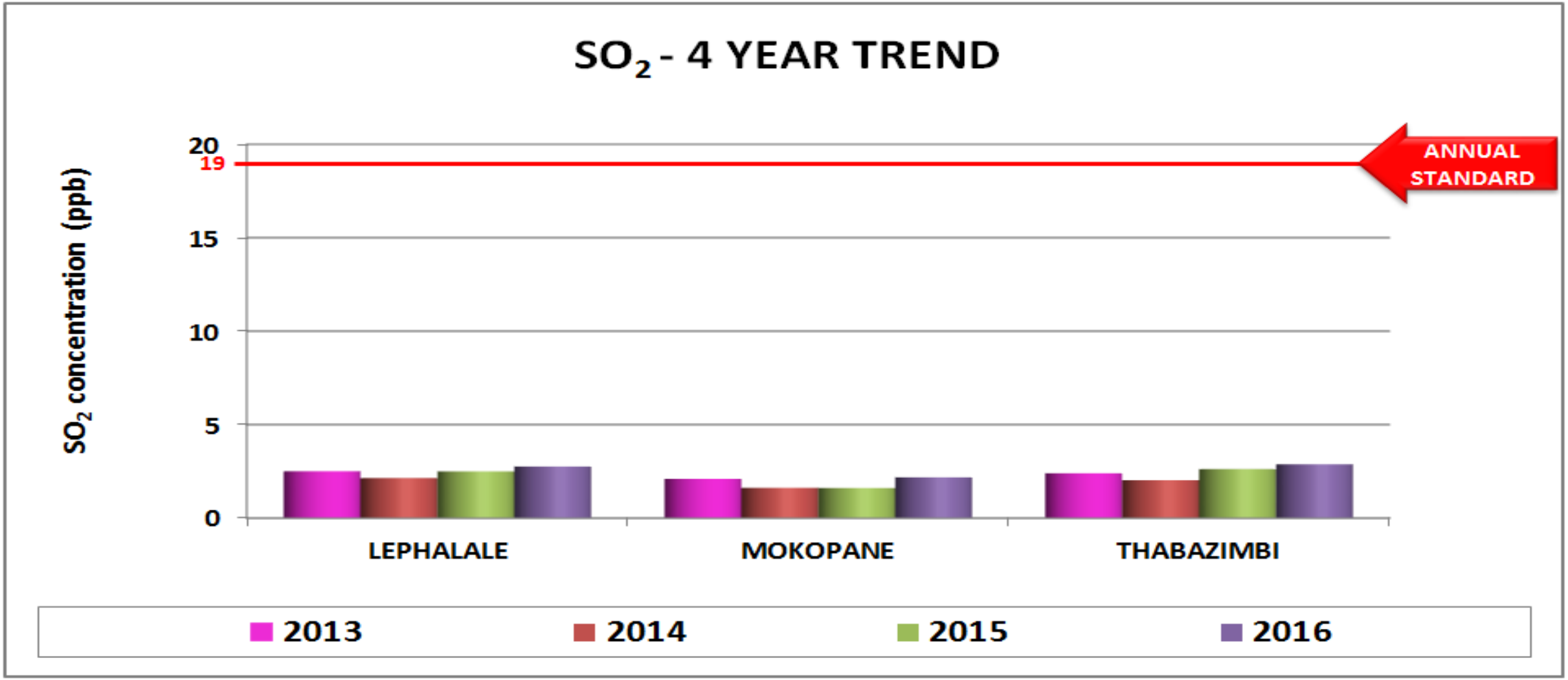
Waterberg Priority Area



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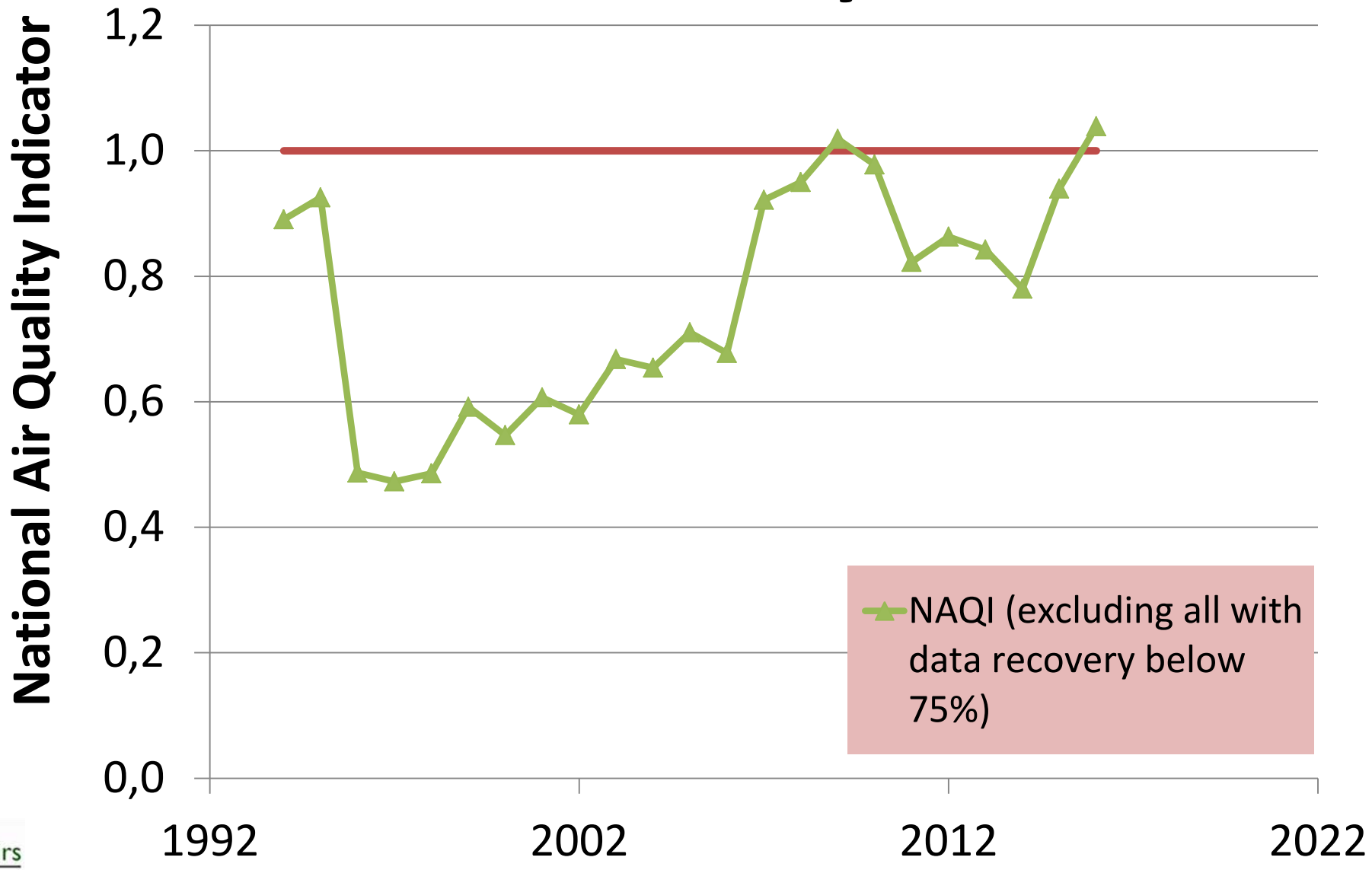
National Air Quality Indicator

National Air Quality Indicator



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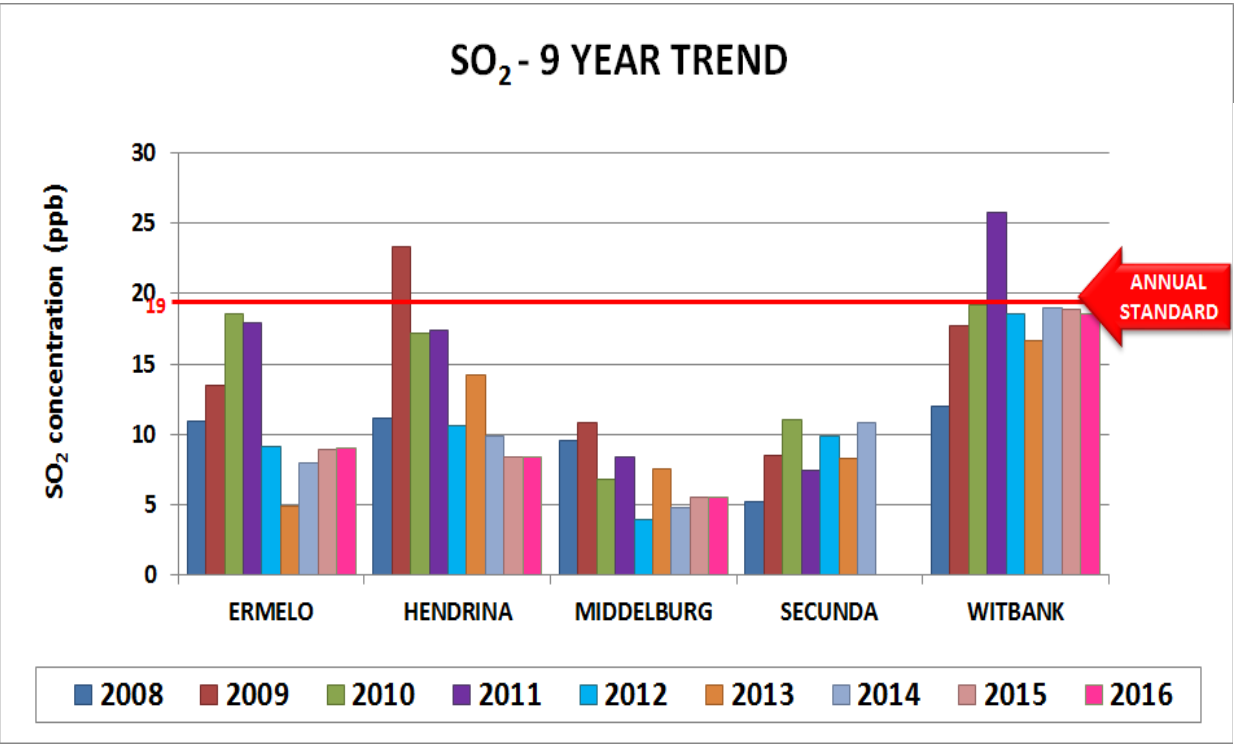
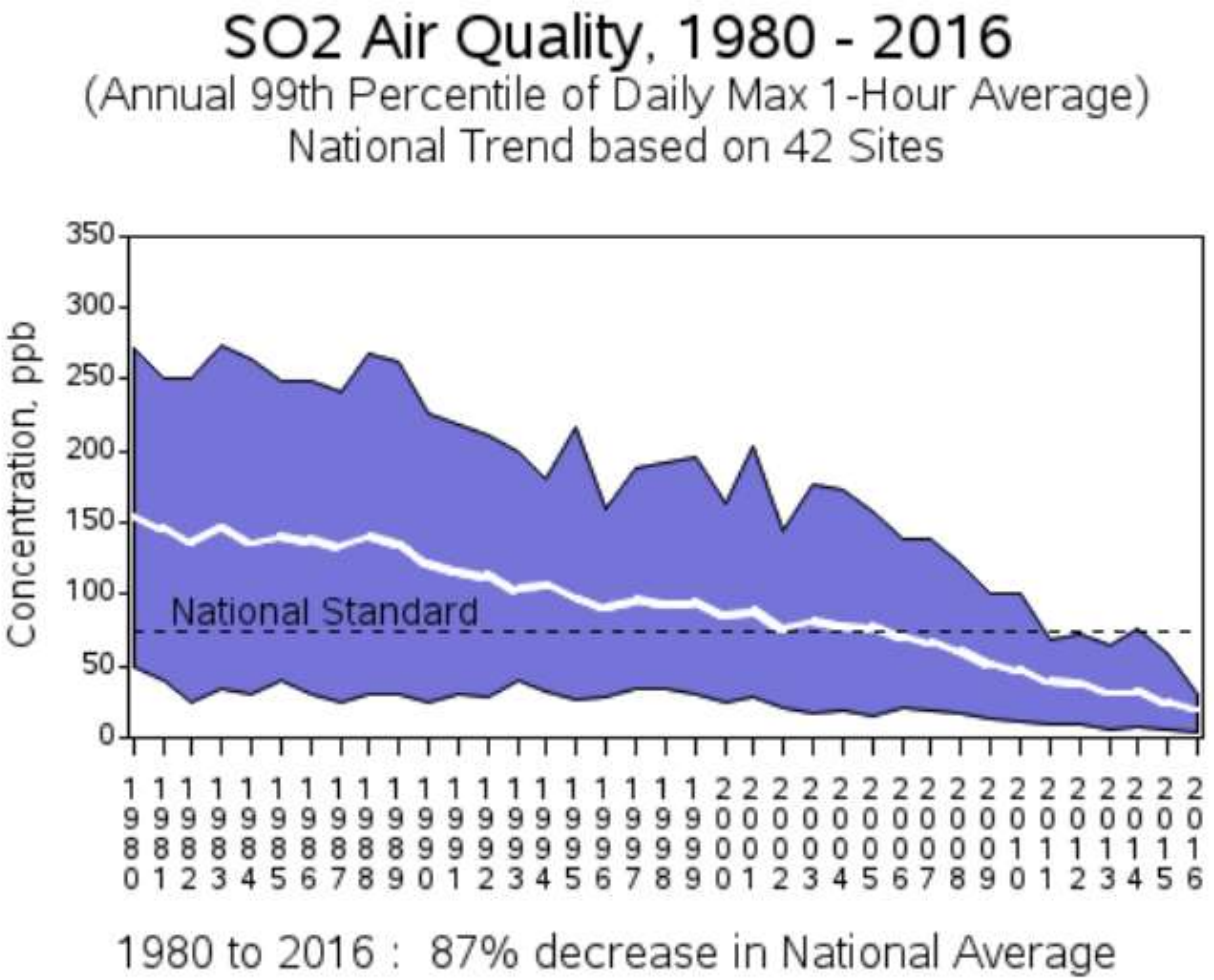
International Examples: How South Africa Compares

- Looking at 2 countries:
  - Air pollution reduction/improvements in the United Kingdom
  - Air pollution reduction/improvements in the United States of America

Air pollution reduction/improvements in the United States of America: SO_2





Graphs from Prof Rebecca Garland:
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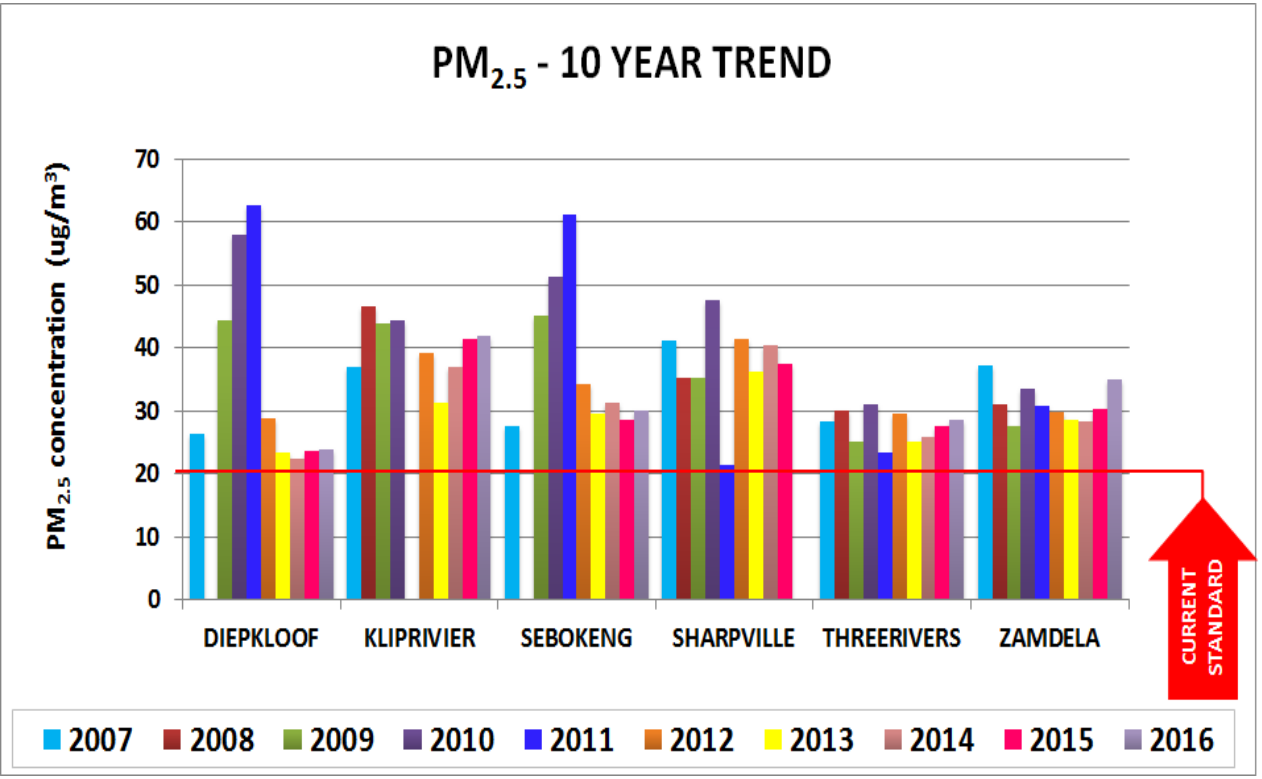
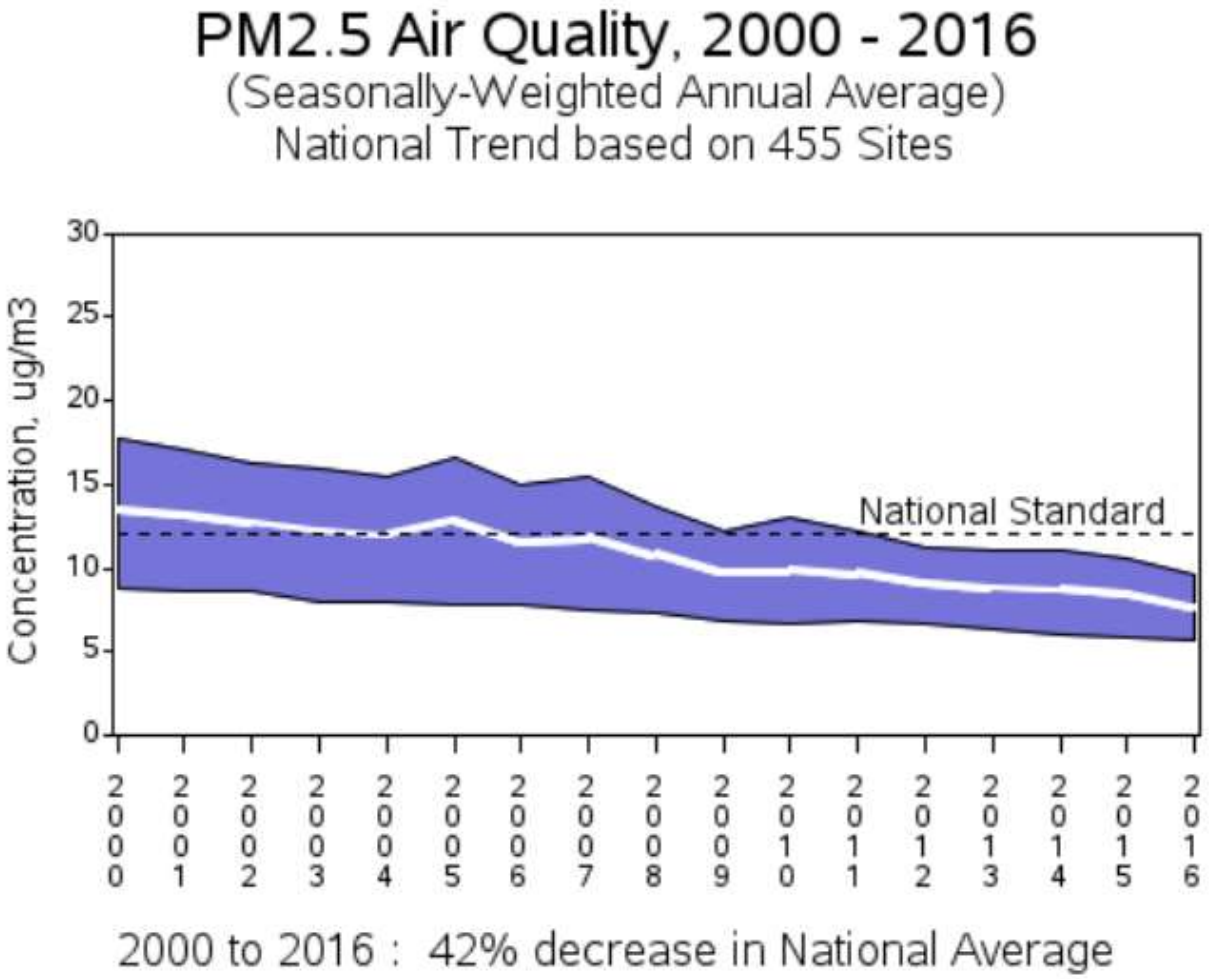
Air pollution reduction/improvements in the United States of America: $PM_{2.5}$





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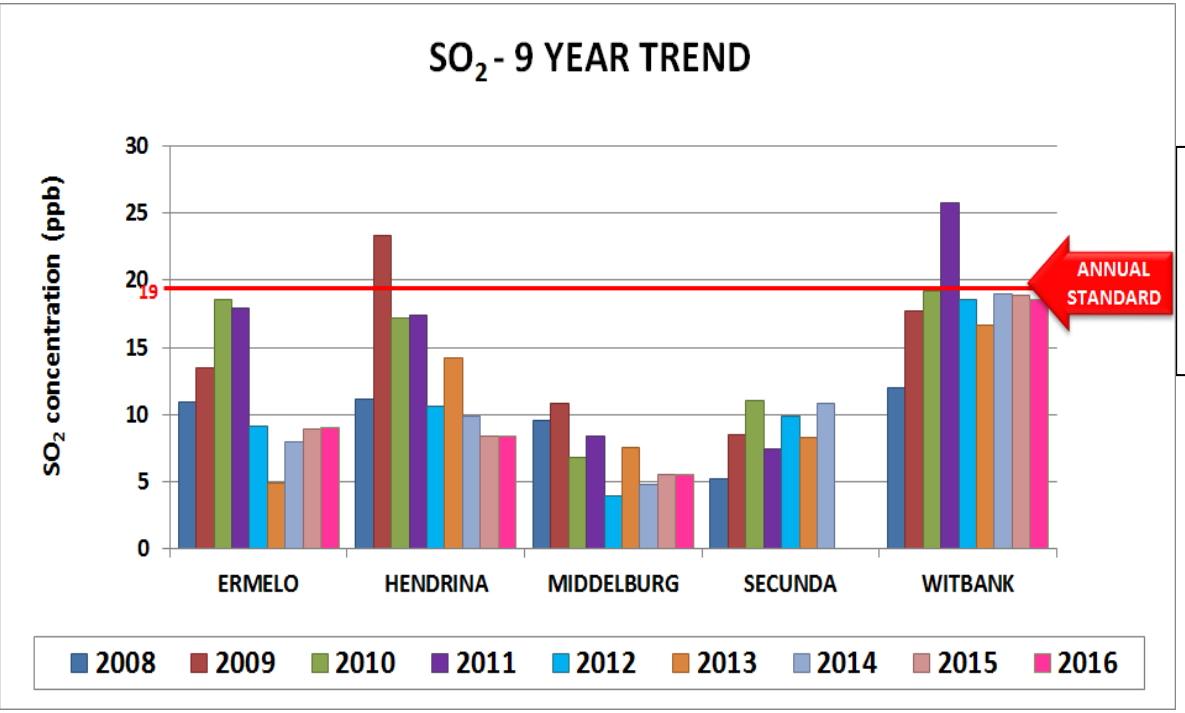
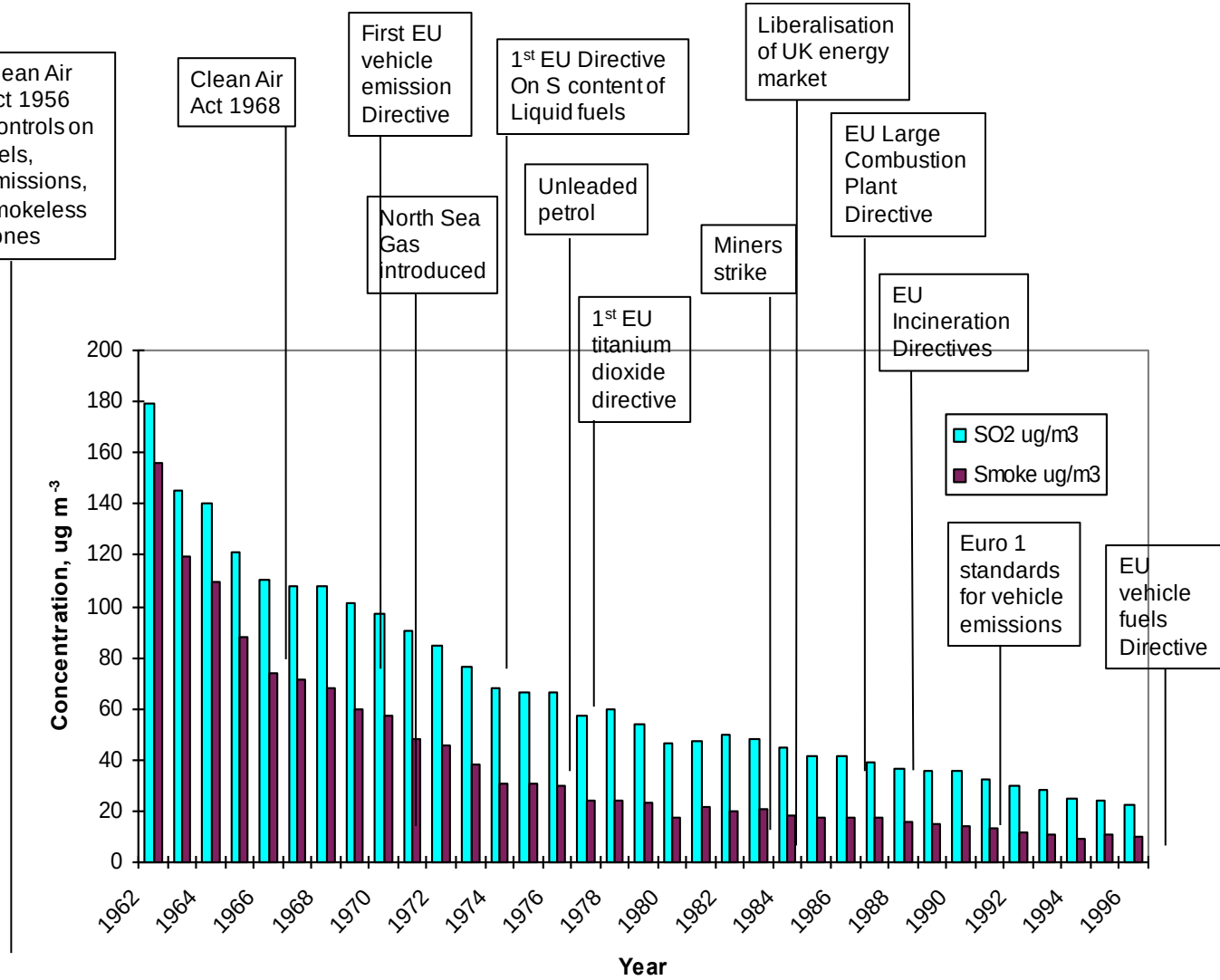
Air pollution reduction/improvements in the United Kingdom: SO_2





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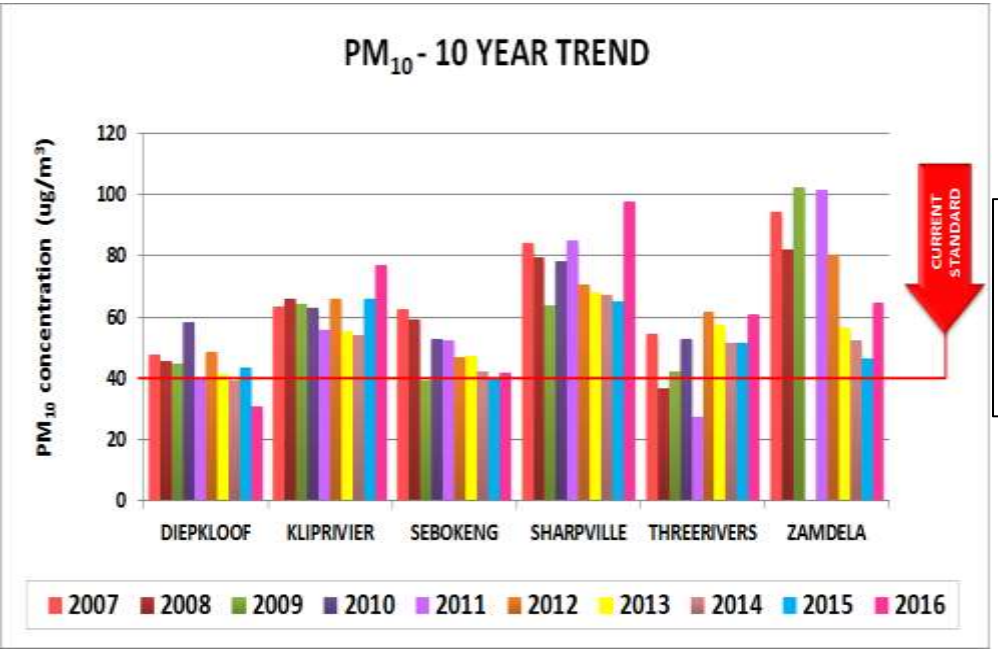
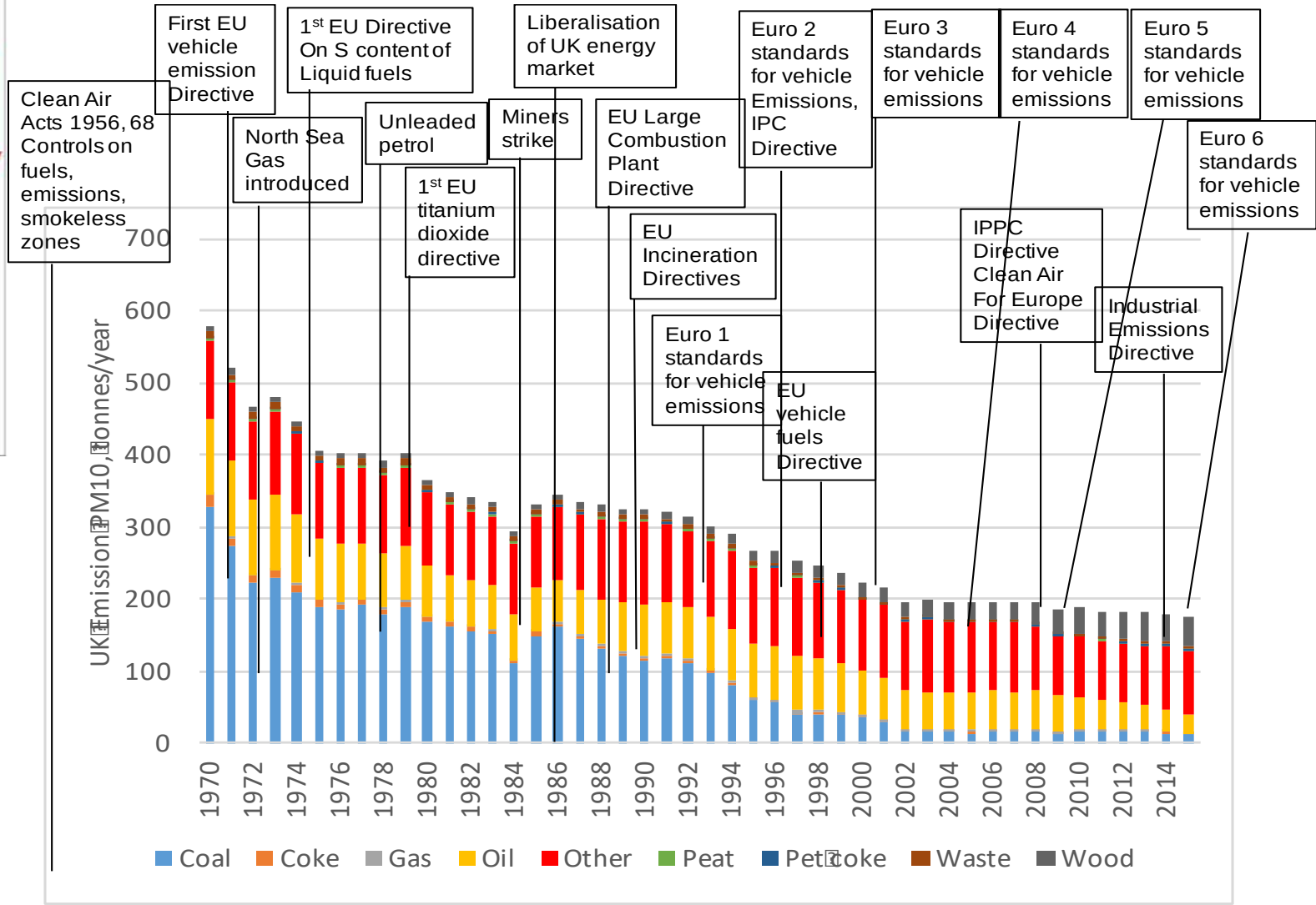
Air pollution reduction/improvements in the United Kingdom: PM_{10}





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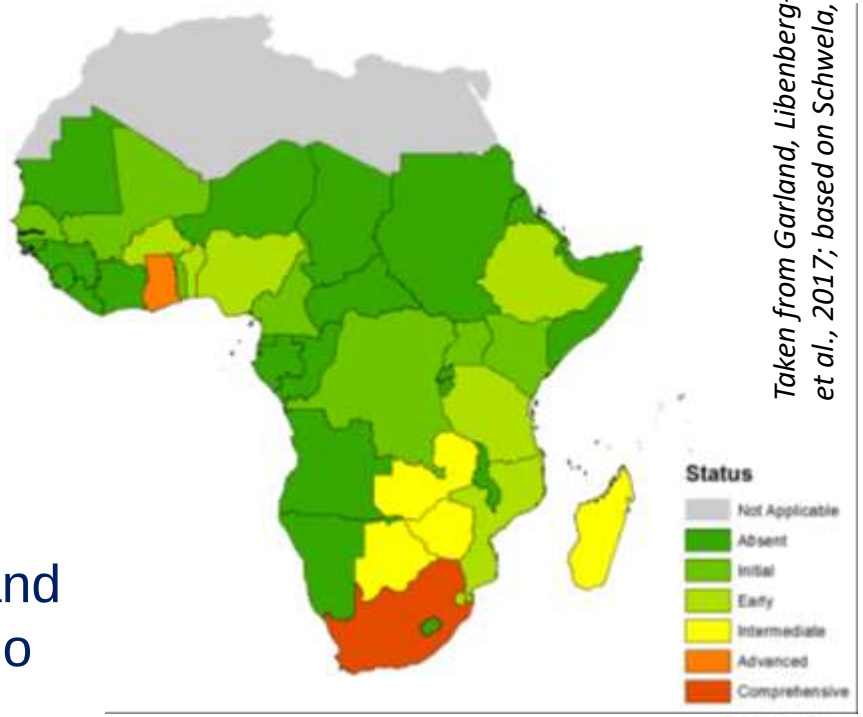
Positive trends in management and air quality

- Scientists have tendency to point out gaps and issues
- **South Africa have the tools to improve air pollution**
- Improving air quality is difficult. It is an on-going process that needs continuous effort
  - Technical knowledge
  - Sustained support
  - "invisible"
  - Involvement of many stakeholders
- Real benefits to improving AQ across sectors (health, agriculture, ecosystems, climate, water, infrastructure)
- Complex situation: Diversity of sources and understanding the counterfactual scenario **(M&E includes monitoring and modelling**)
- Research can assist to provide **evidence base for effective decision-making**



Taken from Garland, Libenberg-Enslin et al., 2017; based on Schwela, 2012

Slide from Prof Rebecca Garland: RGarland@csir.co.za

Authorities' Response: New Developments in AQ Monitoring

- **Air Quality Monitoring Strategy**
  - In principle this strategy seeks to provide **GUIDANCE** for effective air quality monitoring in South Africa;
  - This strategy will also provide **GUIDANCE** on areas where ambient air quality monitoring should be conducted.
- **NAQI Stations Project**
  - DEA identified a **FIXED** number of stations measuring PM10 and SO2 from 2015 have been identified for the reporting of the NAQI;
  - Forty-three (43) stations have been selected for the NAQI reporting;
  - These NAQI stations represent the full spectrum of the National Ambient Air Quality Monitoring Network (NAAQMN) stations characterised by Industrial, Urban, Residential, Traffic etc.
- **Launch of the Upgraded SAAQIS – Wednesday**
  - Live reporting of the State of Air
  - Data available to all users in different platforms including applications

Conclusions – 2017 State of Air Report

- PM is still the greatest national cause for concern in terms of air quality due to numerous pollution sources but climatic conditions are also a major factor;
- Continued and increased national provincial and local action is required in order to bring particulate concentrations down to acceptable levels;
- Many South Africans may be breathing air that is harmful to their health and well-being especially in the priority areas;
- More effort must be put by authorities to resuscitate the NAAQMN – NAQI stations will assist in certain areas; and
- Even with all of this, international examples are showing us that we are in the right path towards pollution reduction, however, major policy shifts in all areas and in particular in the energy, mining and transport sectors are critical to achieve clean air goals.

WELCOME TO THE 12th AIR QUALITY GOVERNANCE LEKGOTLA - 2017!!!

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20 YEARS OF FREEDOM