

# PUBLIC MEETING

To facilitate comment on draft documents

**Application for postponement of compliance timeframes in  
terms of Regulation 11 of the Section 21 NEM:AQA  
Minimum Emissions Standards for the Secunda Synfuels  
Operations**

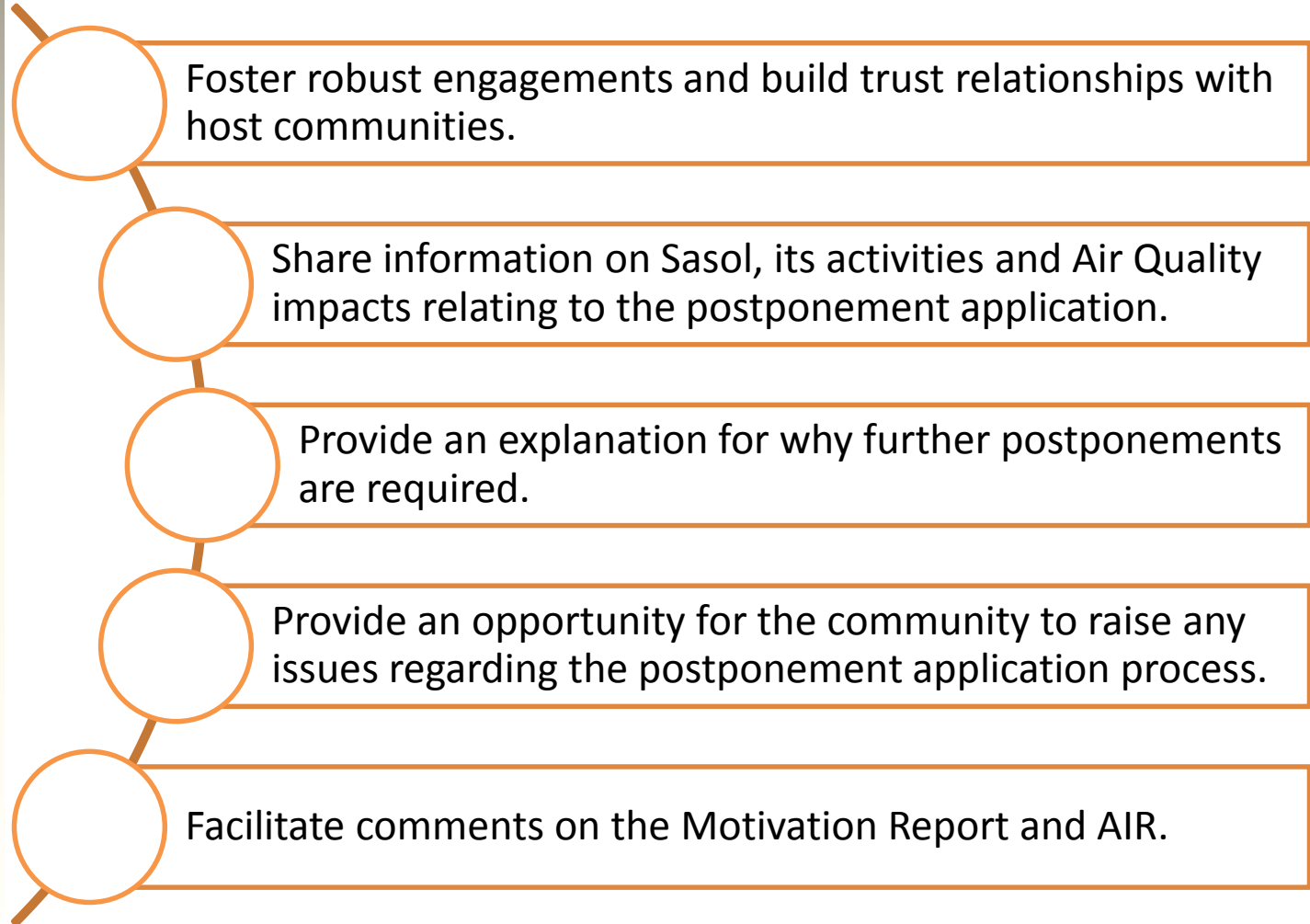


# Agenda

1. Welcome and introduction
2. Health and safety arrangements
3. Rules of Engagement
4. Objectives of the meeting
5. Background to the Secunda Synfuels Operations' (SSO) application
6. Overview of SSO
7. Reasons for postponement application
8. Overview of the results of the Draft Atmospheric Impact Report
9. Overview of the Stakeholder Engagement Process
10. Discussion and Questions
11. Way Forward and Closure

**Facilitator:**  
**Elna de Beer**

# Objectives of the meeting

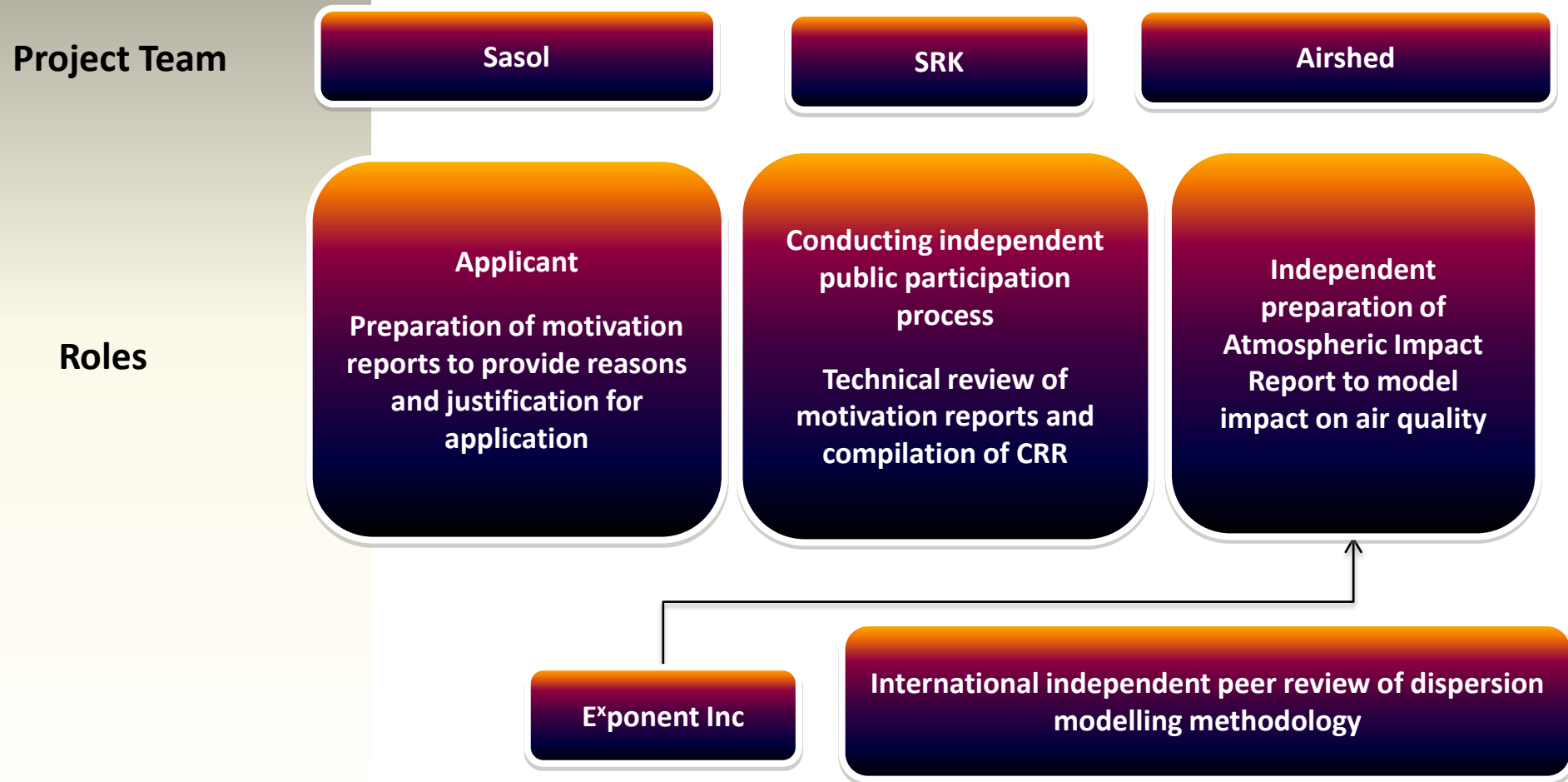


# Presentations

1. Project team and Legal Requirements – SRK
2. Background to SSO's application – Sasol
3. Overview of Sasol's operations – Sasol
4. Reasons for postponement application – Sasol
5. Overview of the results of the Draft Atmospheric Impact Report ("AIR") – Airshed
6. Overview of the Stakeholder Engagement Process - SRK

**Facilitator:**  
**Elna de Beer**

# Project Team: Roles and responsibilities



# Legal Requirements

Postponement of Compliance Timeframes in terms of Regulations 11 and 12 of the Section 21 NEM:AQA Minimum Emissions Standards (“GN893”)

5 year postponement per application

*In accordance with Regulation 11 of GN. 893*

Atmospheric Impact Report compiled by an independent specialist

*Report in accordance with the Atmospheric Impact Report Regulations (GN. 747) of October 2013*

*Dispersion Modelling in accordance with GN. 533 of July 2014*

Reasons and justifications for applications

Public Participation Process

*In accordance with Chapter 6 of the Environmental Impact Regulations (GN. 982) of December 2014*



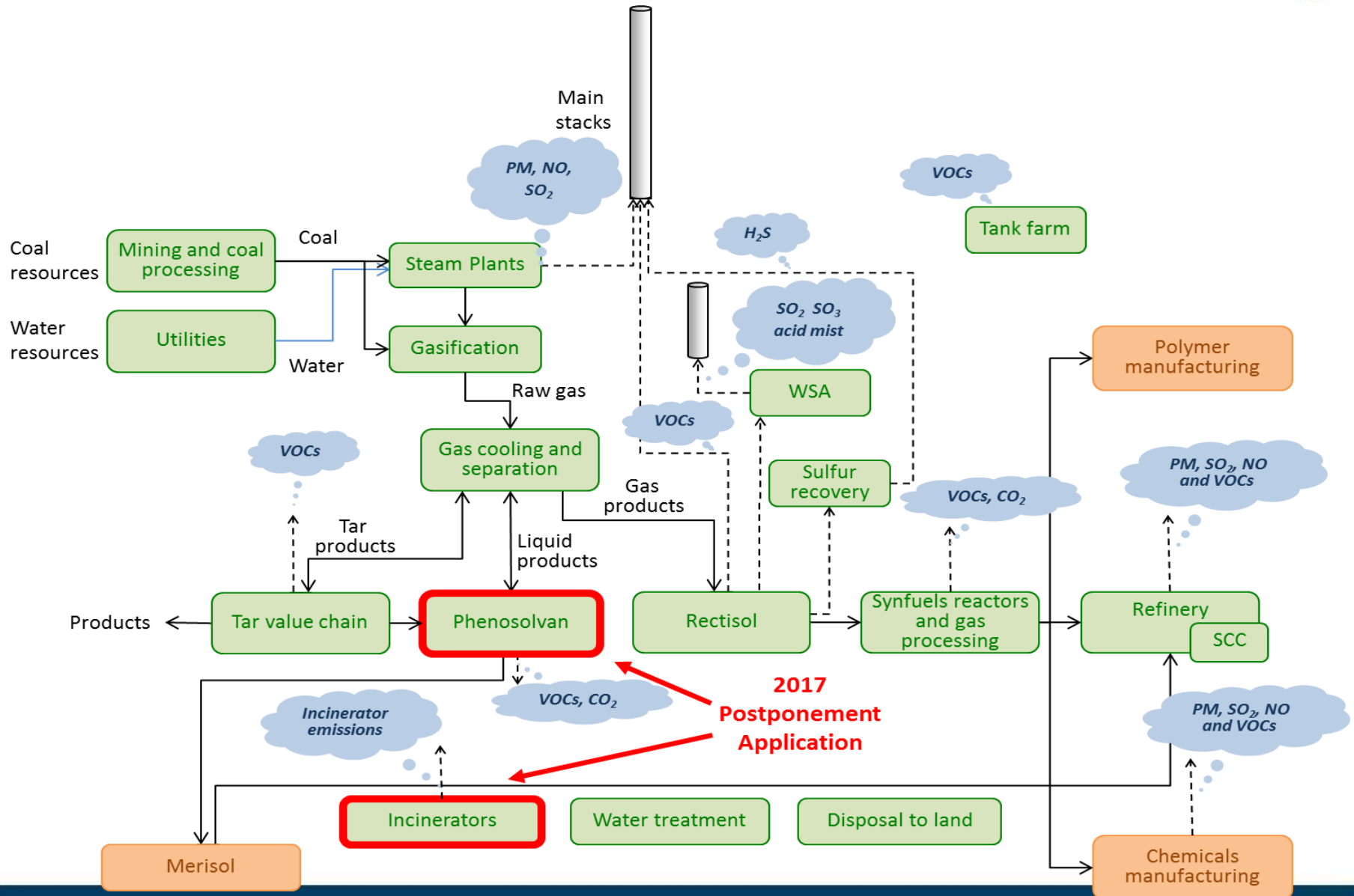
SASOL

# SECUNDA SYNFUELS OPERATIONS ("SSO")

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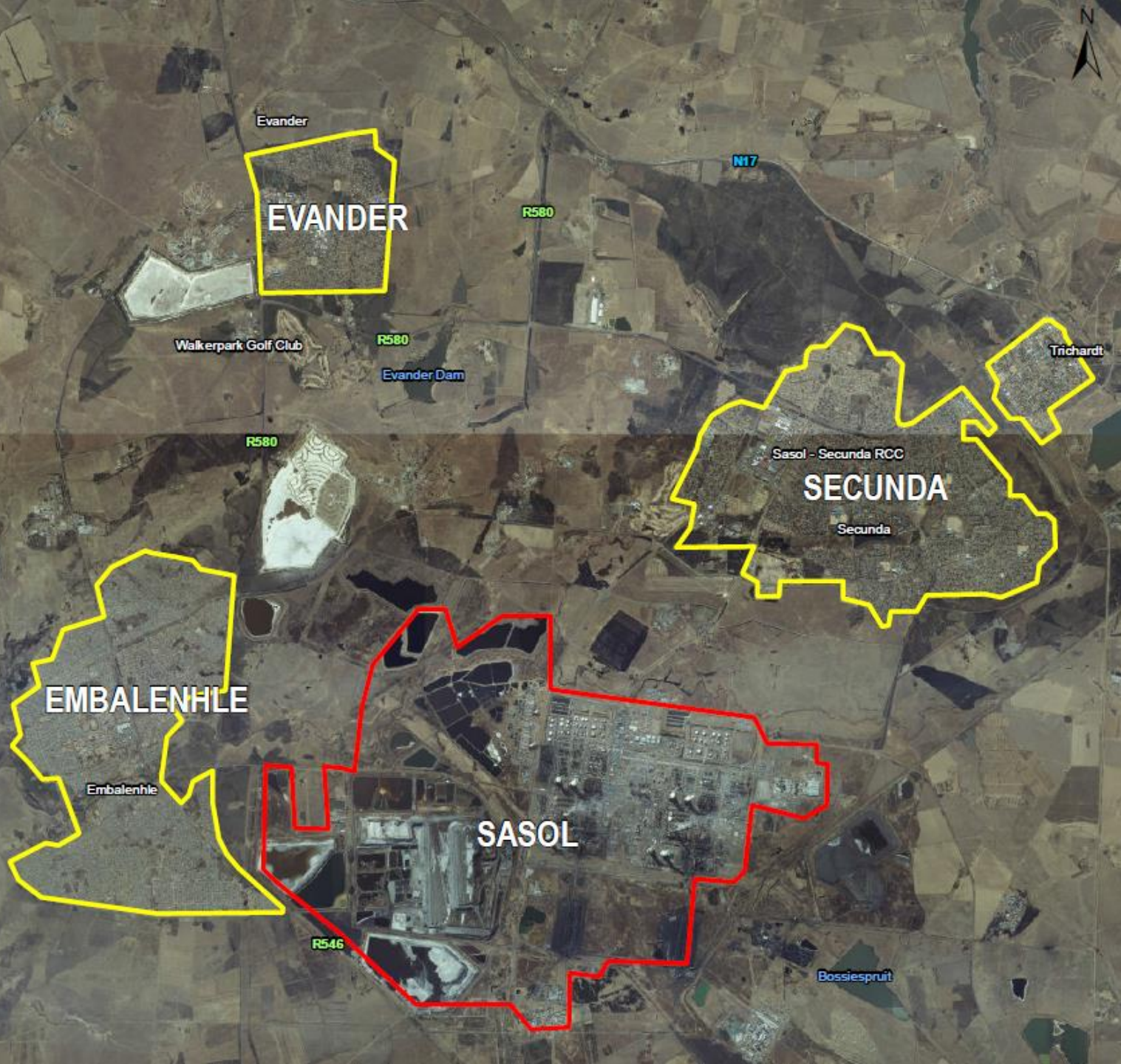


# SSO Emission Sources





## Sasol's location in Secunda



## Previous Postponement Application

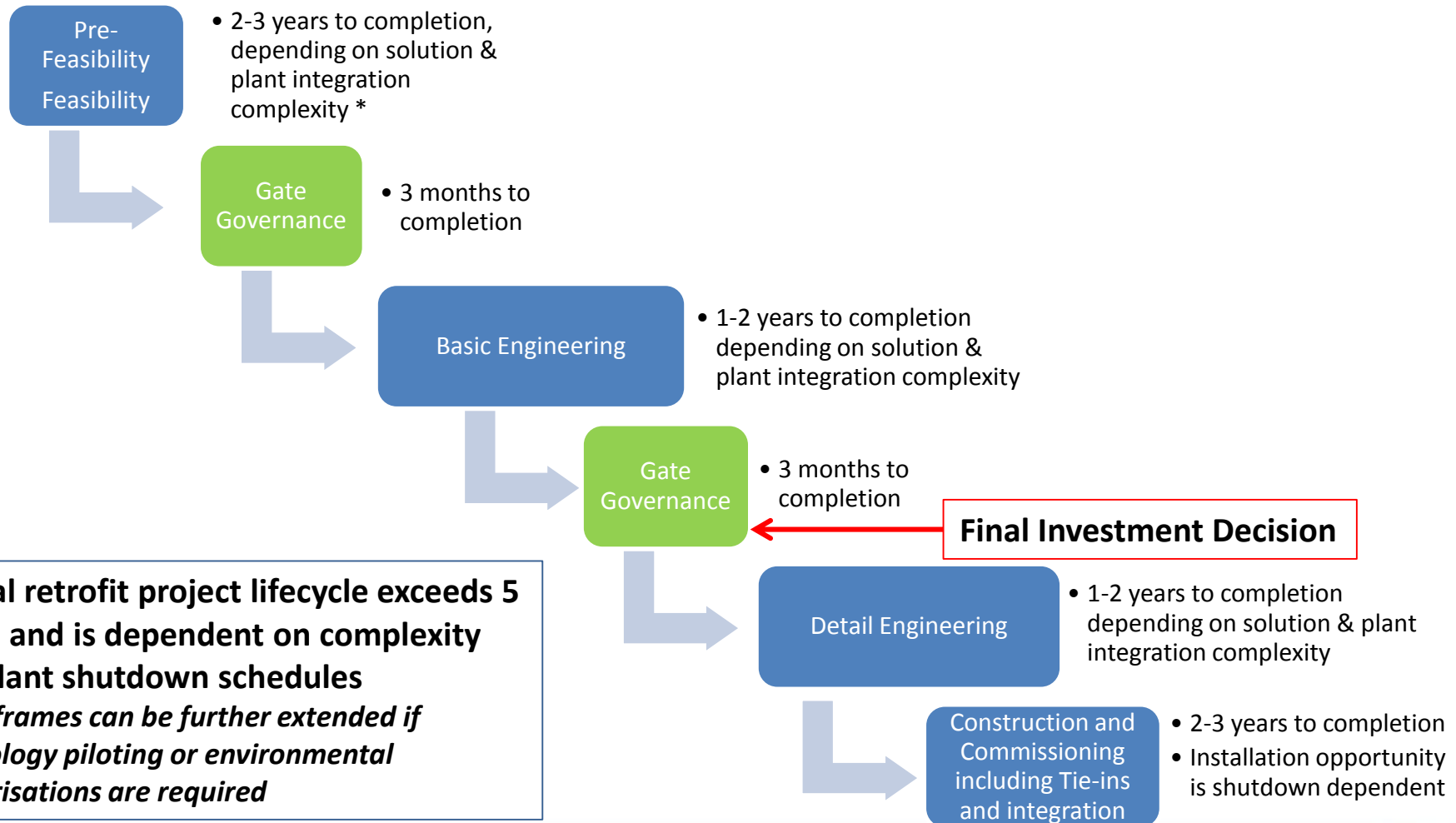
- A feasible solution to meet the 2013 MES had not been identified yet for the incinerators at the time of commencing the 2014 Postponement Application.
- Regulation 11 of the MES allows for a postponement period up to 5 years per application.
- Sasol therefore legitimately anticipated that 5 years per application would be granted to allow sufficient time for the investigation and adoption of options to achieve compliance, as motivated in the 2014 postponement application.
- The NAQO however granted postponement only for three years only until 31 March 2018.
- Investigations have since been undertaken to identify potentially feasible options to achieve compliance to both 2015 and 2020 standards.
- The three year postponement period granted did not allow sufficient time to identify and implement the most feasible solution and hence a further extension of the compliance time frame is required to enable compliance.

# Reasons for applying for postponements



## Project due diligence obligations

### Typical retrofit project lifecycle including Gate Governance requirements



**Typical retrofit project lifecycle exceeds 5 years, and is dependent on complexity and plant shutdown schedules**

***\*Timeframes can be further extended if technology piloting or environmental authorisations are required***

### Modifying a brownfields operation

1. Modifying an existing brownfields operation is considerably more challenging than building a new greenfields plant.
2. Every modification or retrofit has to be developed around the existing plant with a retrofit.
3. There is little available space, limiting the options for equipment and introducing access limitations for both construction teams and the equipment required.
4. Maintenance programs, necessary for statutory compliance and safety, compete for access and working space, requiring careful scheduling, especially shutdown opportunities.
5. An existing site poses safety hazards that do not exist on a greenfields site.
6. These challenges mean that implementation of brownfields retrofits take substantially longer than greenfields installations.



# SSO's Postponement Application



Category 3.6 - The production and clean-up of a gaseous stream derived from coal gasification

- Phenosolvan Plant – 5 years to 2023

Category 8.1 – Thermal Treatment of Hazardous and General Waste

- High Organic Waste incinerator (HOW)– 5 years to 2023
- Biosludge incinerator – 5 years to 2023

SSO previously submitted a postponement application requesting a 5 year postponement (2014 Postponement Application). In these instances a 3 year postponement was granted for the above mentioned sources. For these sources SSO is now requesting a further postponement of the compliance timeframes to enable compliance.

# Monitoring and Improvements since previous postponement application (2014 postponement application)



Phenosolvan

- Engineering work completed to install sample point to enable Test run
- Test run to determine whether CO<sub>2</sub> added to the saturation column affected VOC emissions
- Test run proved CO<sub>2</sub> addition to have marginal effect on VOC emissions, therefore other technical options are now being investigated

HOW Incinerators

- Quarterly emissions monitoring
- Operational improvements
- Work to determine the composition of the waste streams and the associated emissions completed

Biosludge incinerators

- Quarterly emissions monitoring
- Operational improvements
- Developments towards waste beneficiation through composting – disappointing results
- Investigations into alternative composting methods under consideration

## Technology options under consideration to achieve compliance – Phenosolvan Plant



### Not feasible

- Remove CO<sub>2</sub> to the saturation column (Test run)
- Flaring to combust the VOC emissions to carbon dioxide
- Catalytic oxidation

### To be further investigated

- Liquid removal prior to abatement
- Membrane separation
- Absorption
- Regenerative Thermal Oxidation (RTO)

### Not favourable

- Condensation

# Technology options under consideration to achieve compliance

## – HOW Incinerators



### Implemented

- Operational improvements

### Undesirable Outcome

- Reduction in exit temperature

### Most likely infeasible

- HOW as an alternative fuel to a third party

### In progress - to be determined. Technology decision: Q3 2019

- Installation of abatement technology on existing equipment
- Installation of new incinerator
- Integrated incinerator option

### Will not change emission concentrations only load

- Reduction of the waste streams being incinerated at source and beneficial utilisation



# Technology options under consideration to achieve compliance

## – Biosludge Incinerators



### Implemented

- Operational improvements

### In progress - to be determined. Technology decision: Q3 2019

- Refurbishment of existing equipment and installation of additional abatement technology on existing equipment
- Installation of a new incinerator
- Integrated incinerator option
- Utilisation as alternative fuel resource by third party

### Not feasible

- Alternative technology (super critical water oxidation)
- Landfilling - bio-gas harvesting possibility

### Will not change emission concentrations only load

- Reduction of the waste streams being incinerated at source and beneficial utilisation

# Atmospheric Impact Report (AIR) Secunda Synfuels Operations



February 2017

Reneé von Gruenewaldt  
Terri Bird

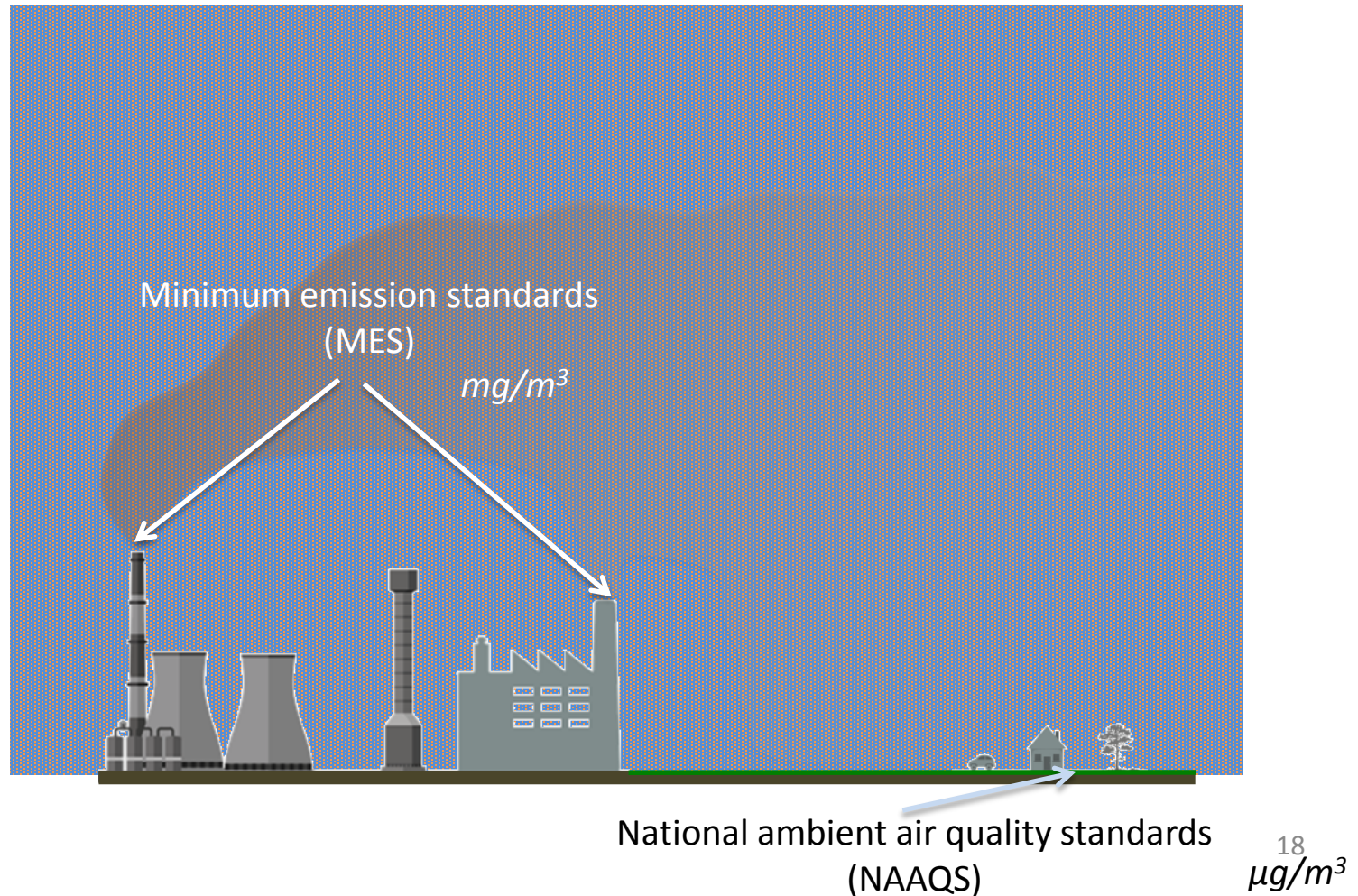


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# INTRODUCTION

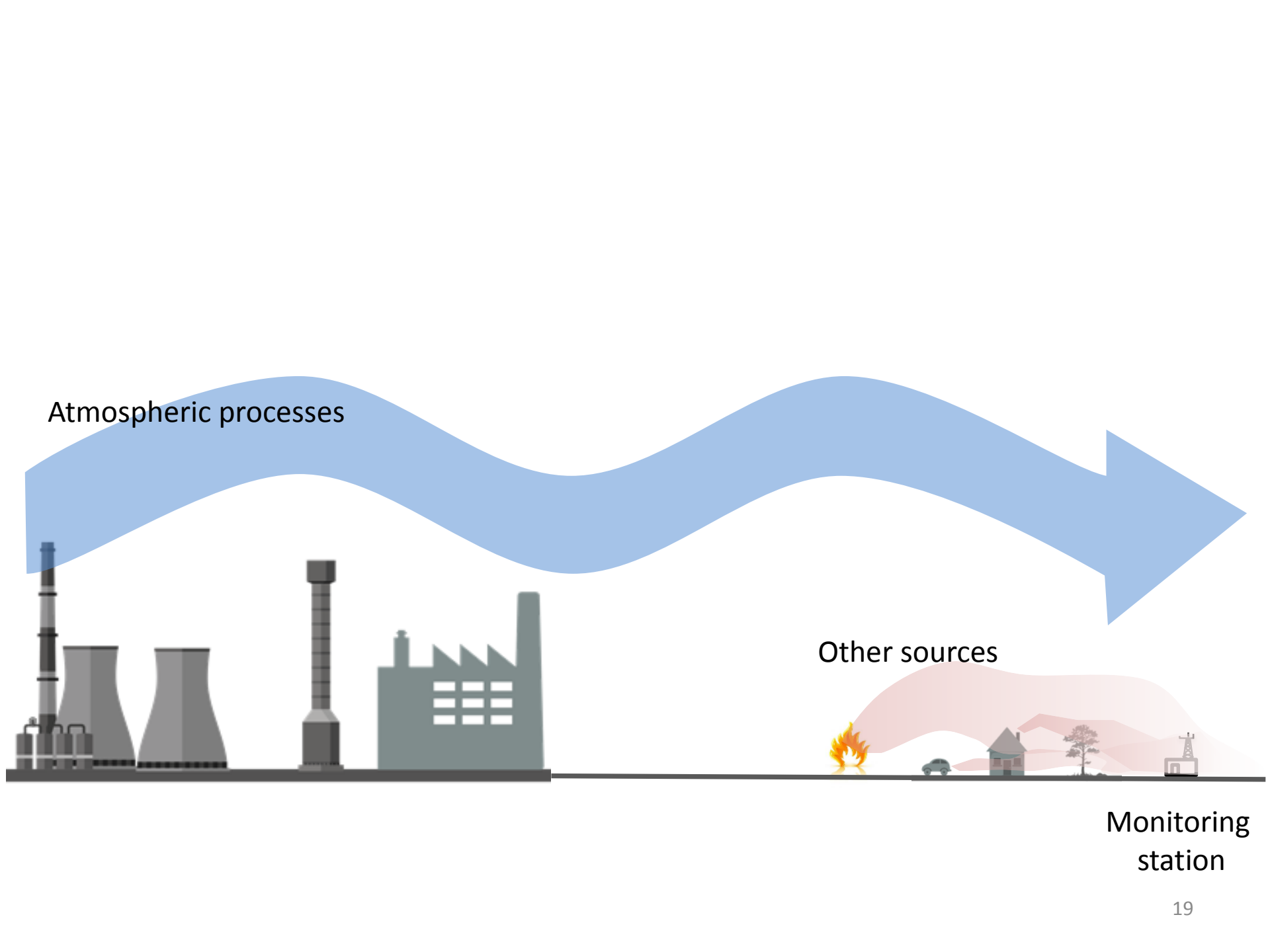
- What do these applications mean for air quality?
- Impacts of SSO's postponement application is compiled in the AIR which is informed by the MES and NAAQS

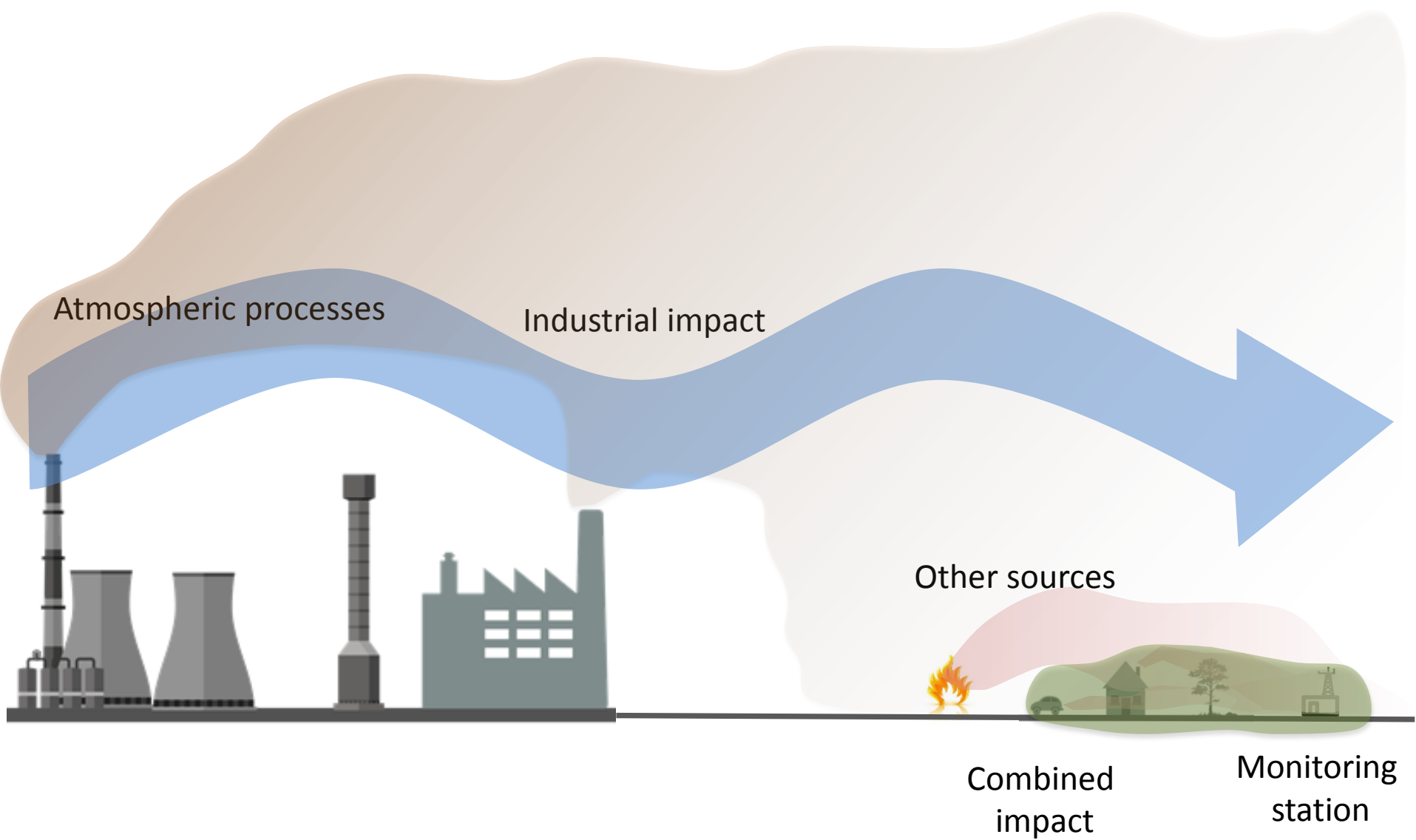


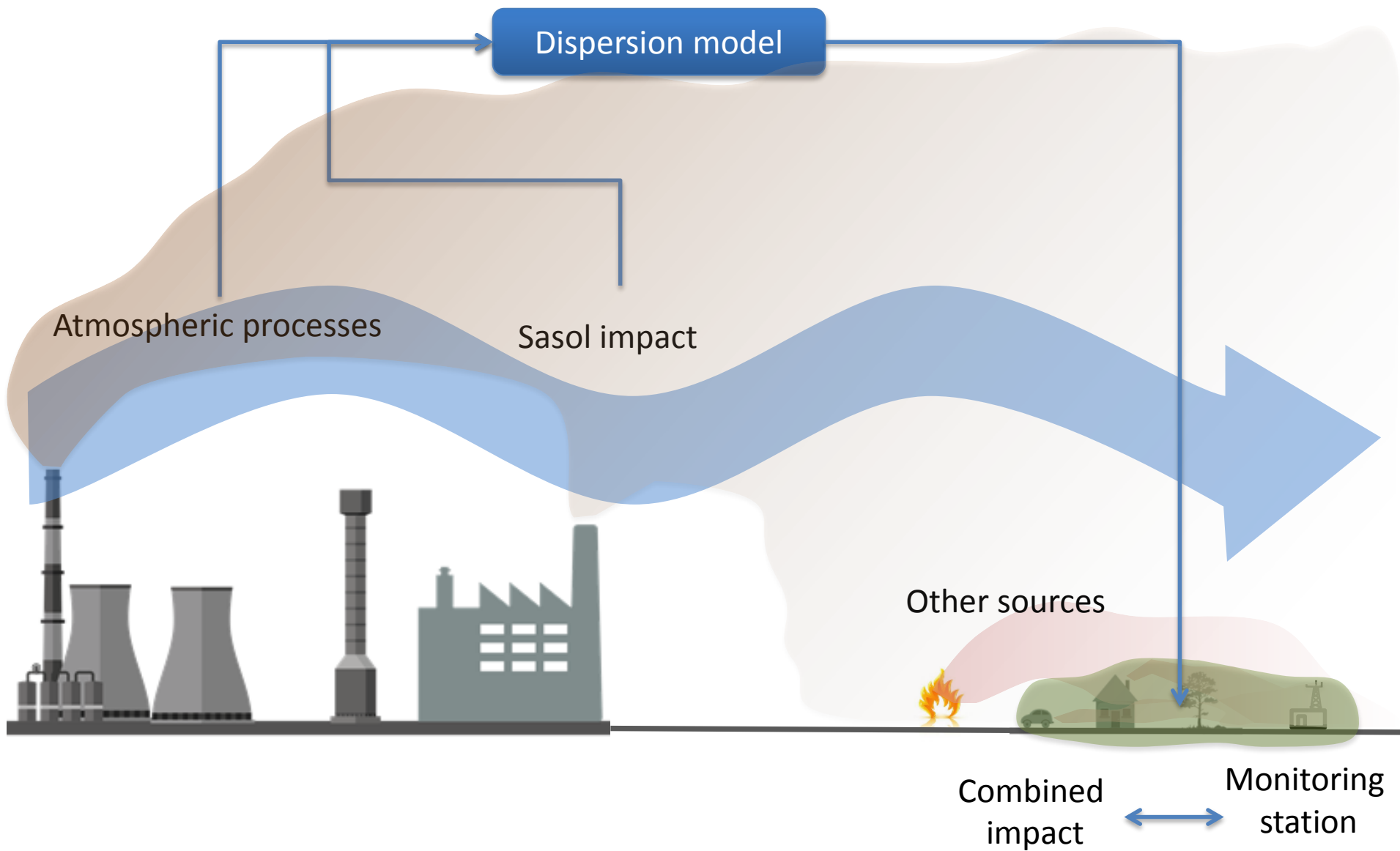
Atmospheric processes

Other sources

Monitoring  
station



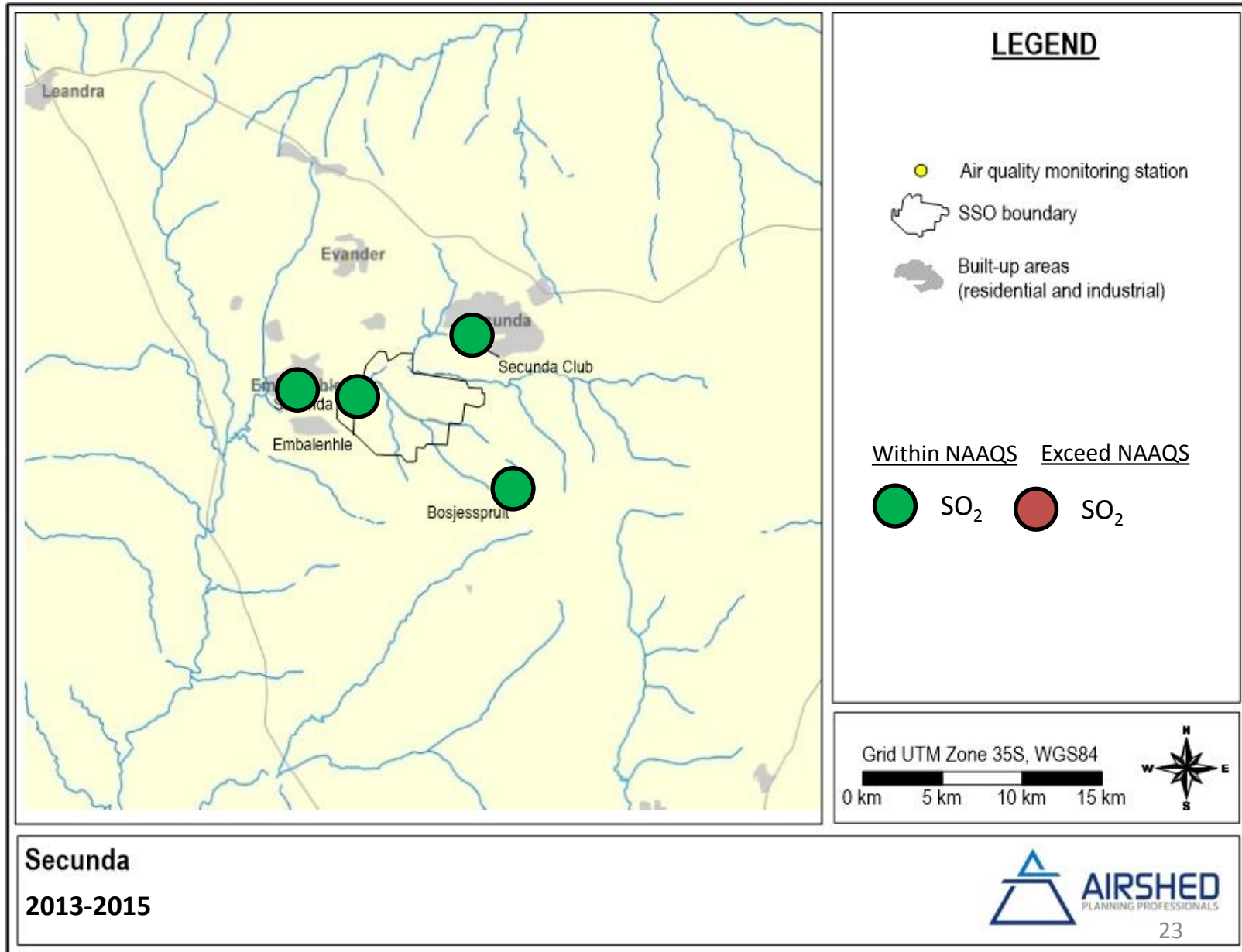




# AIR METHODOLOGY

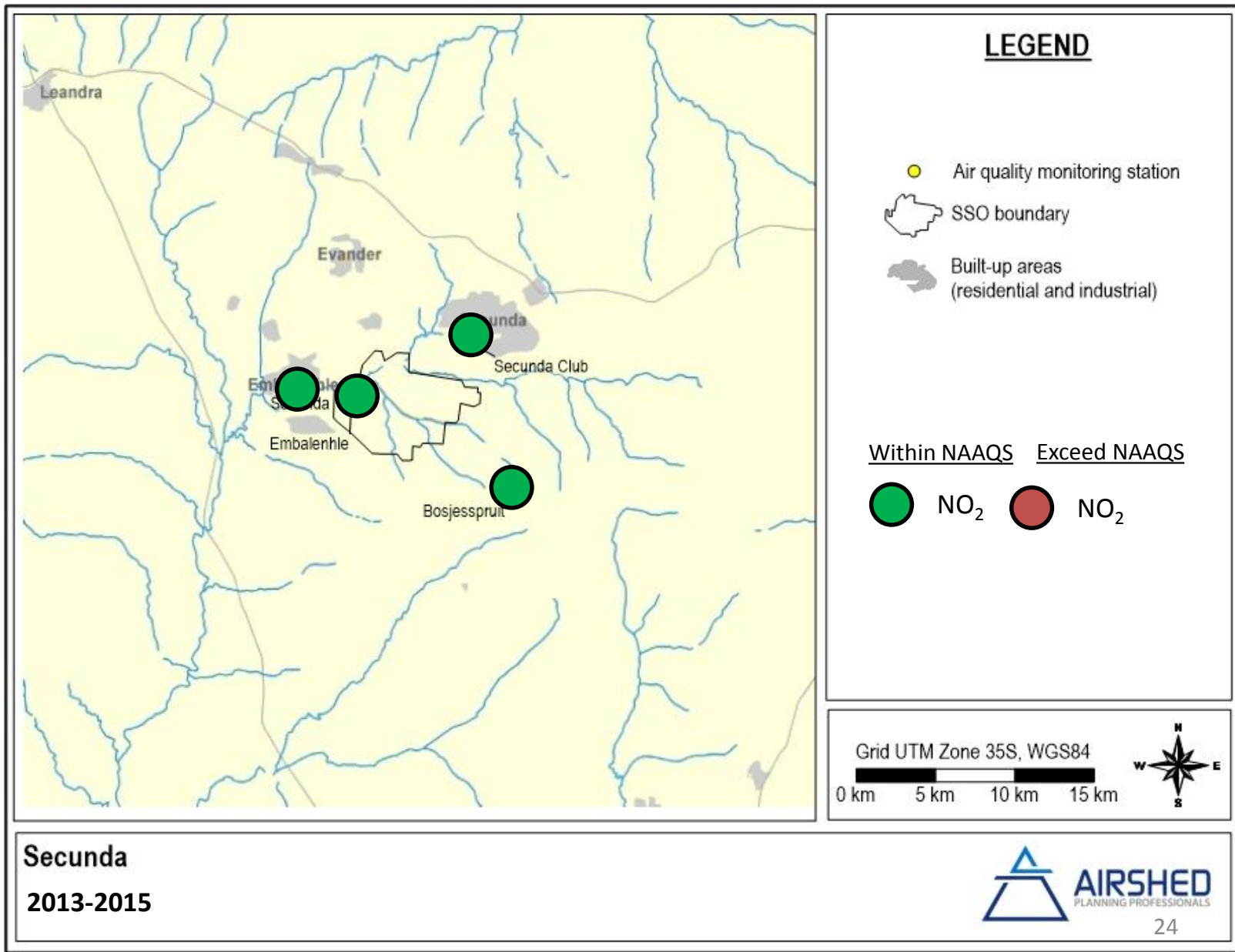
- Regulations Prescribing Format of Atmospheric Impact Report (GN747 of 2013)
- Regulations Regarding Air Dispersion Modelling (GN533 of 2014)
- Section 21 NEM:AQA Minimum Emissions Standards (GN893 of 2013)
- National Ambient Air Quality Standards (GN 1210 of 2009)
- National Ambient Air Quality Standard for PM<sub>2.5</sub> (GN 486 of 2012)
- National Dust Control Regulations (GN 827 of 2013)

# CURRENT STATE OF AMBIENT AIR QUALITY – SO<sub>2</sub> (2013-2015)

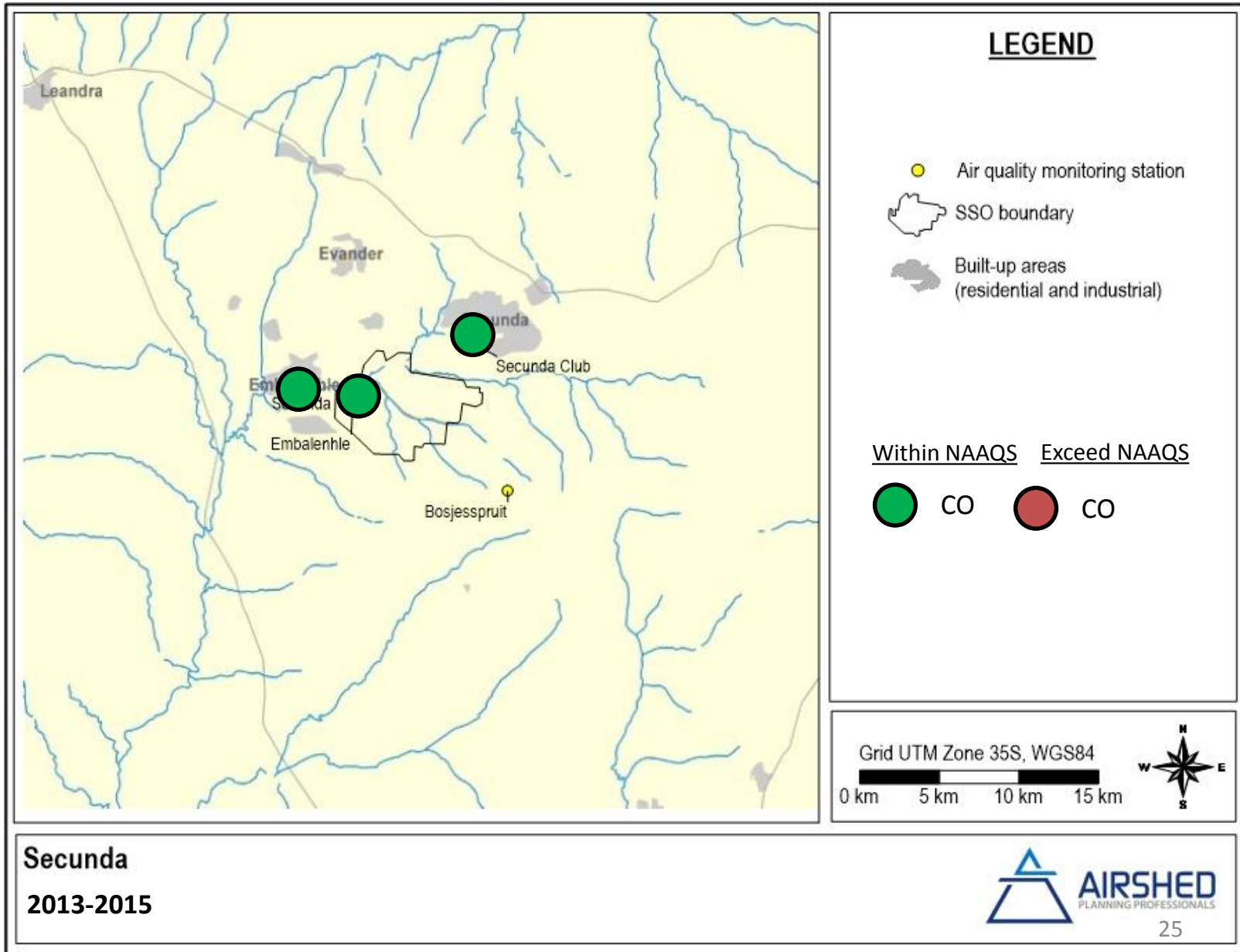




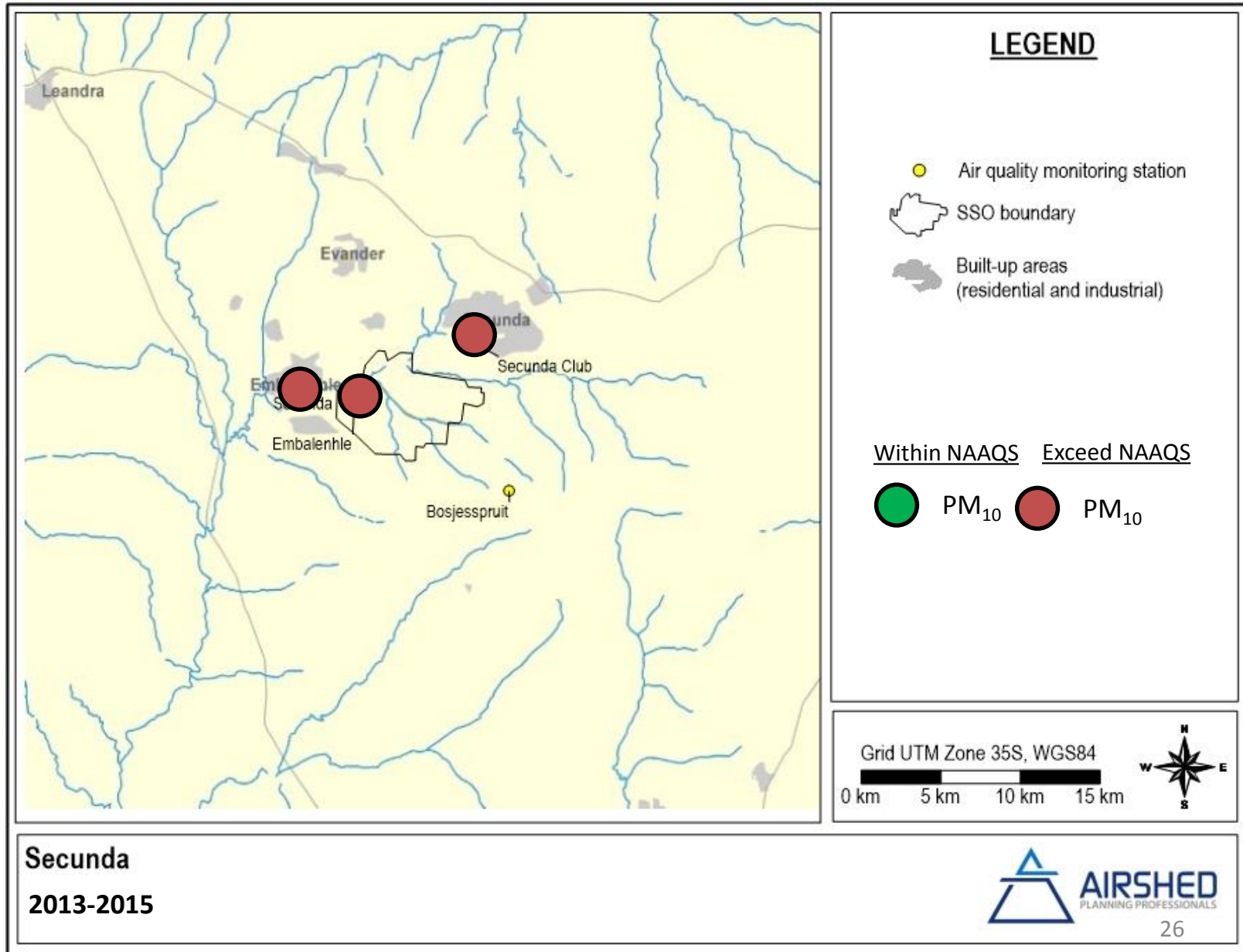
# CURRENT STATE OF AMBIENT AIR QUALITY – NO<sub>2</sub> (2013-2015)



# CURRENT STATE OF AMBIENT AIR QUALITY – CO (2013-2015)

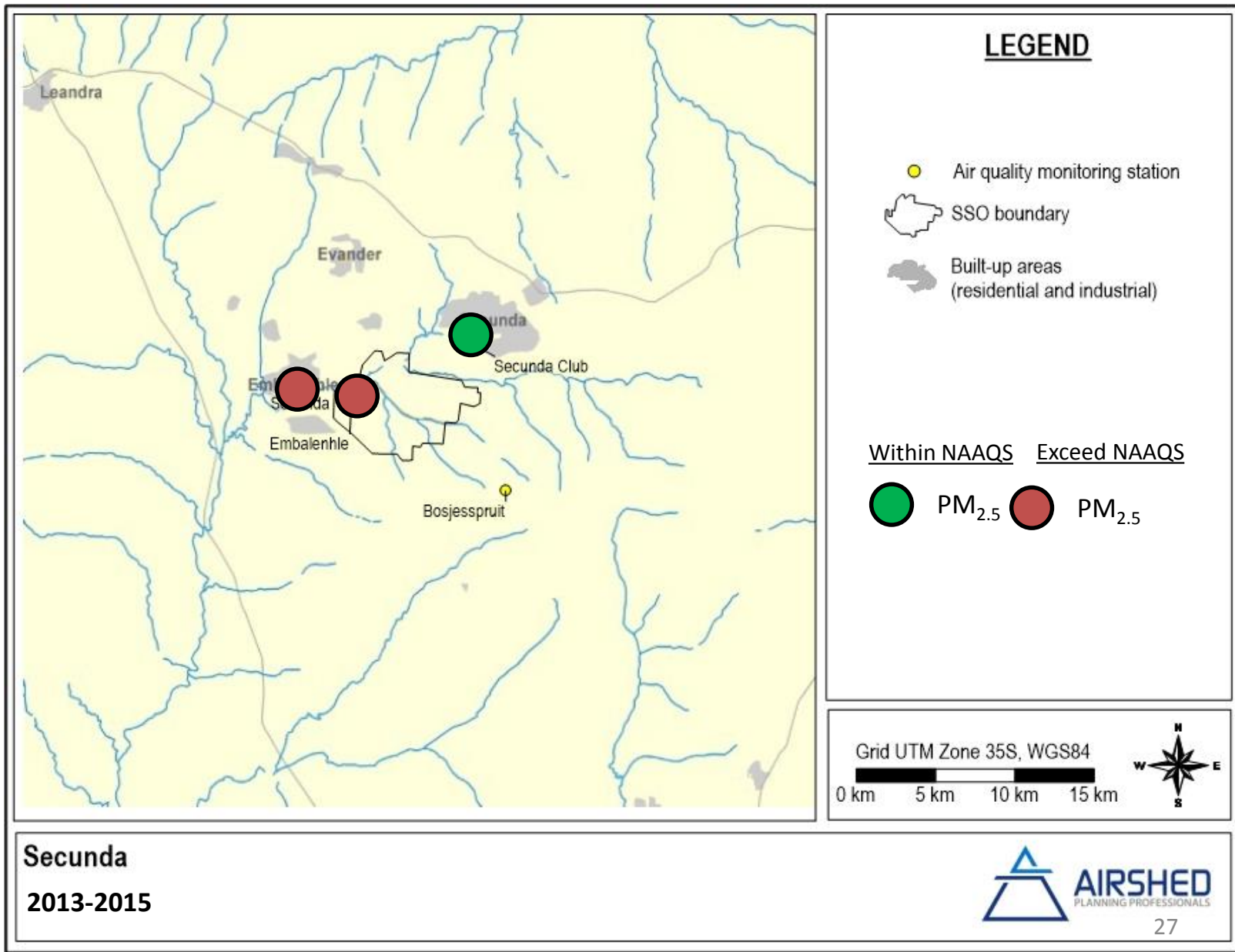


# CURRENT STATE OF AMBIENT AIR QUALITY – PM<sub>10</sub> (2013-2015)

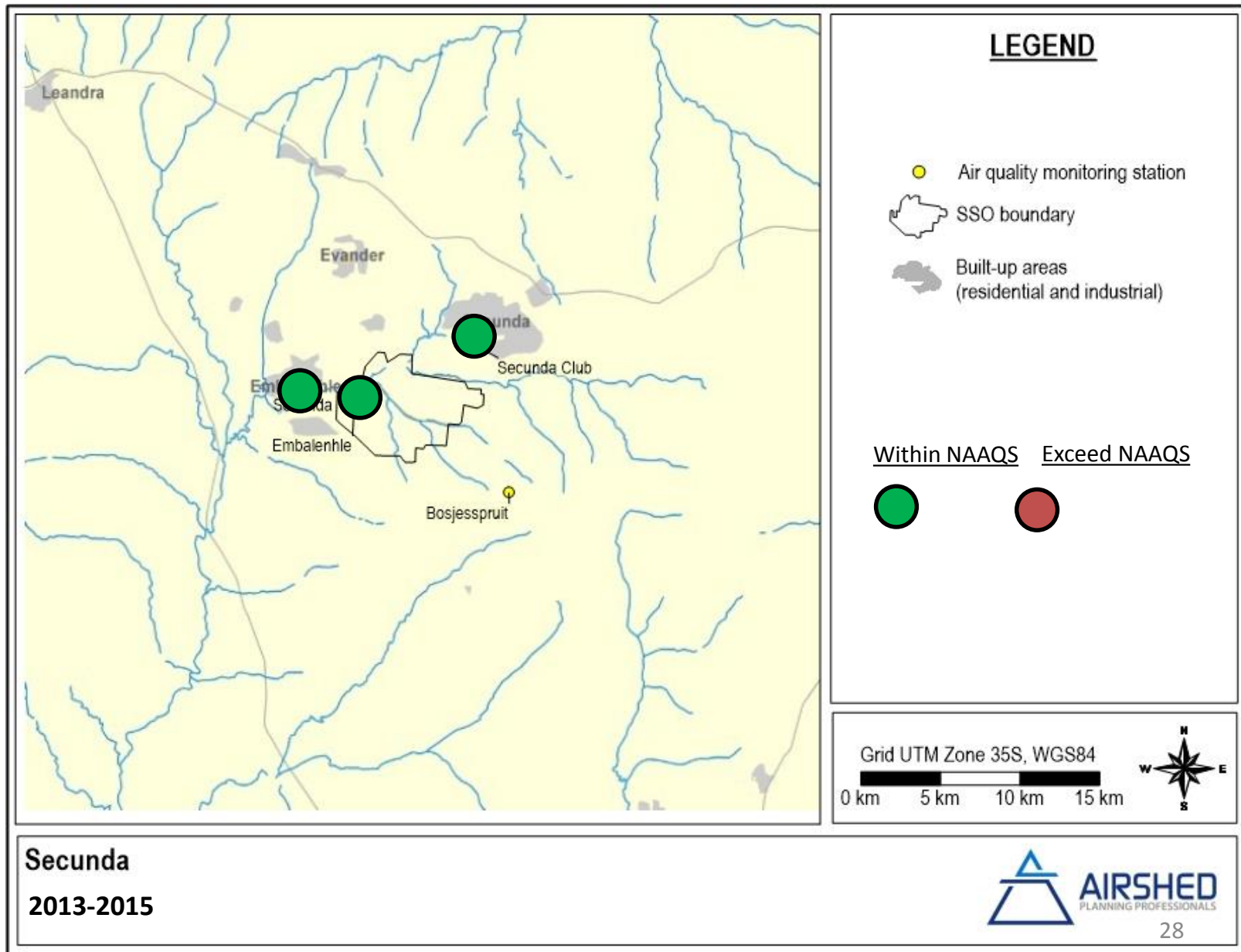




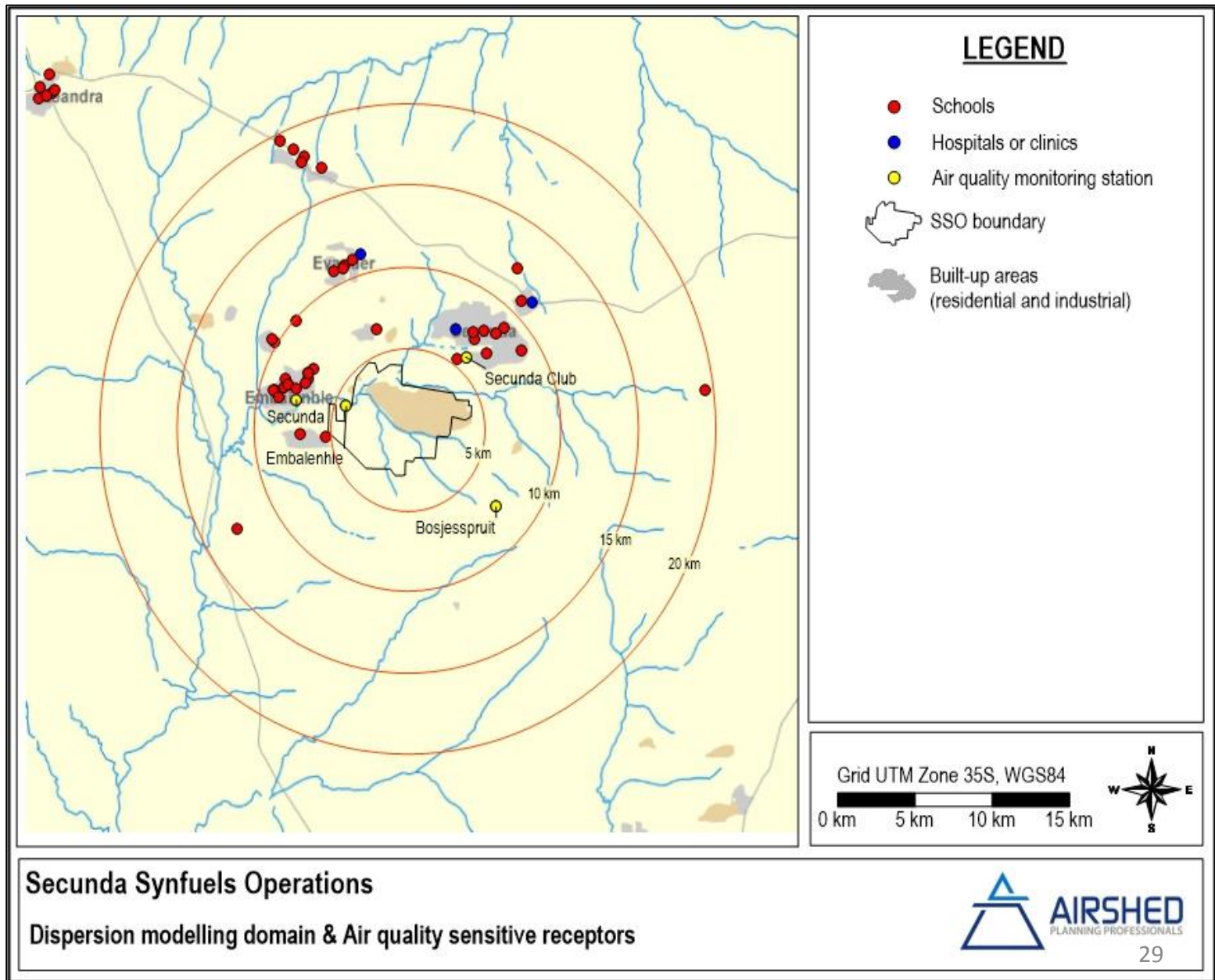
# CURRENT STATE OF AMBIENT AIR QUALITY – PM<sub>2.5</sub> (2013-2015)



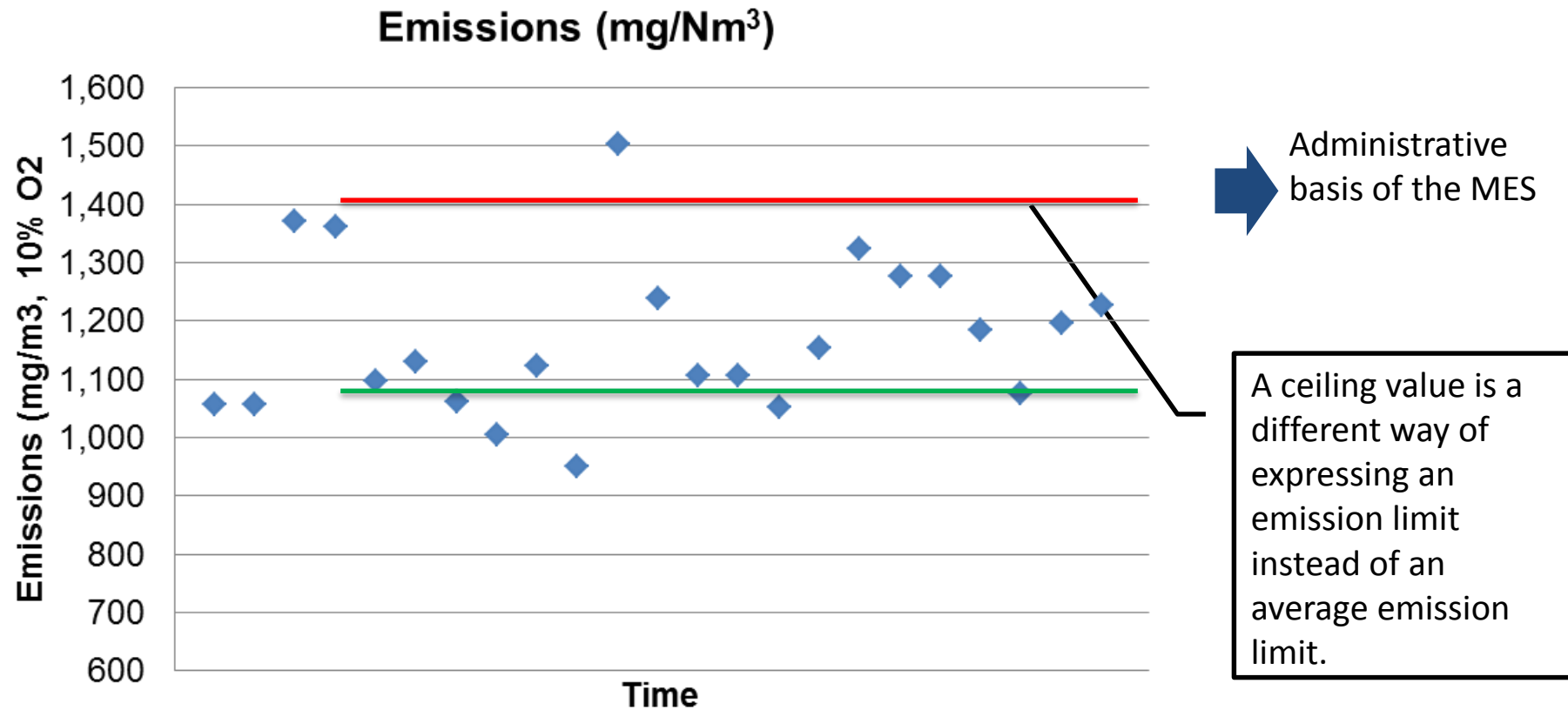
# CURRENT STATE OF AMBIENT AIR QUALITY – Benzene (2013-2015)



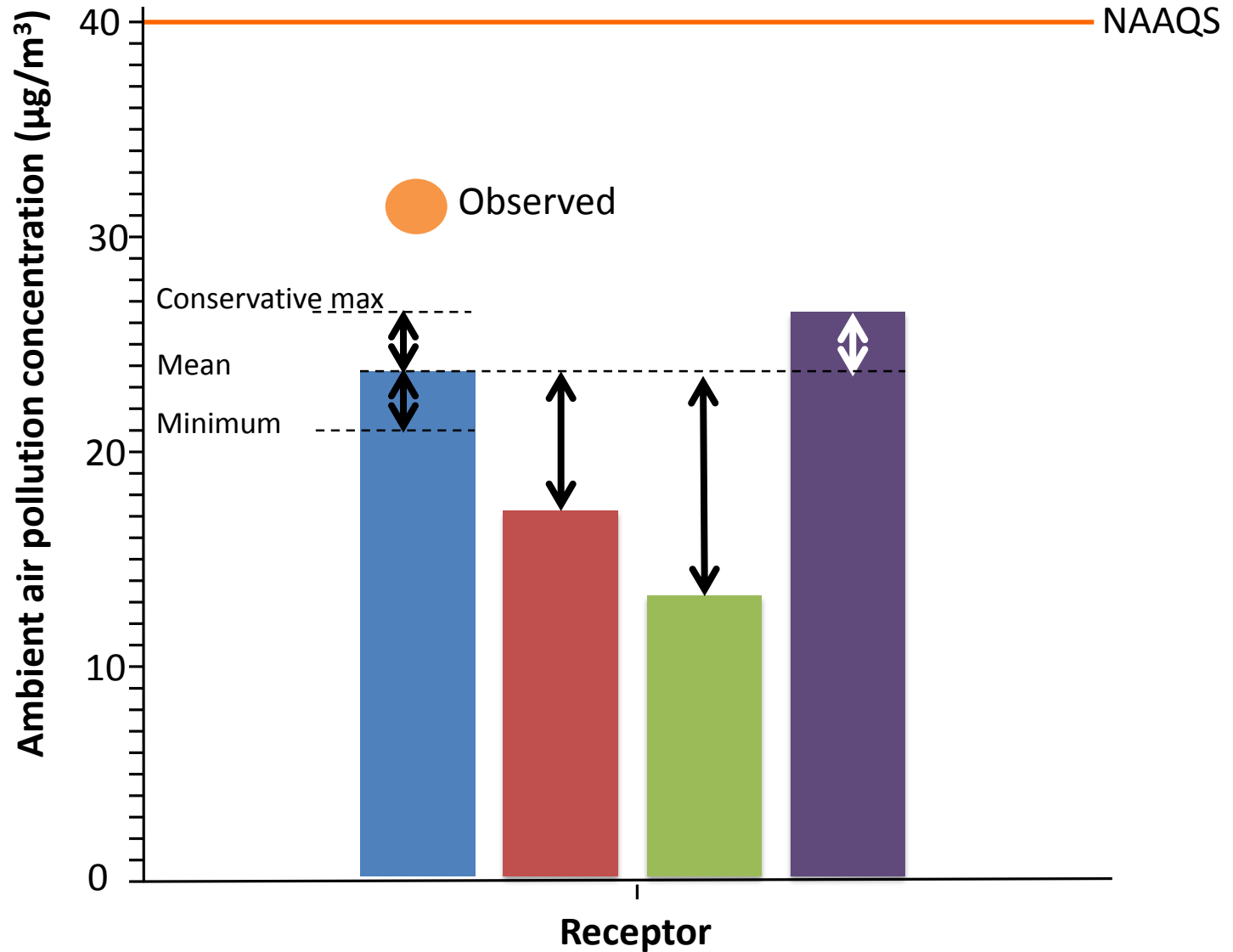
# RECEPTORS (Prediction Points)



# The difference between ceiling and average emission limits

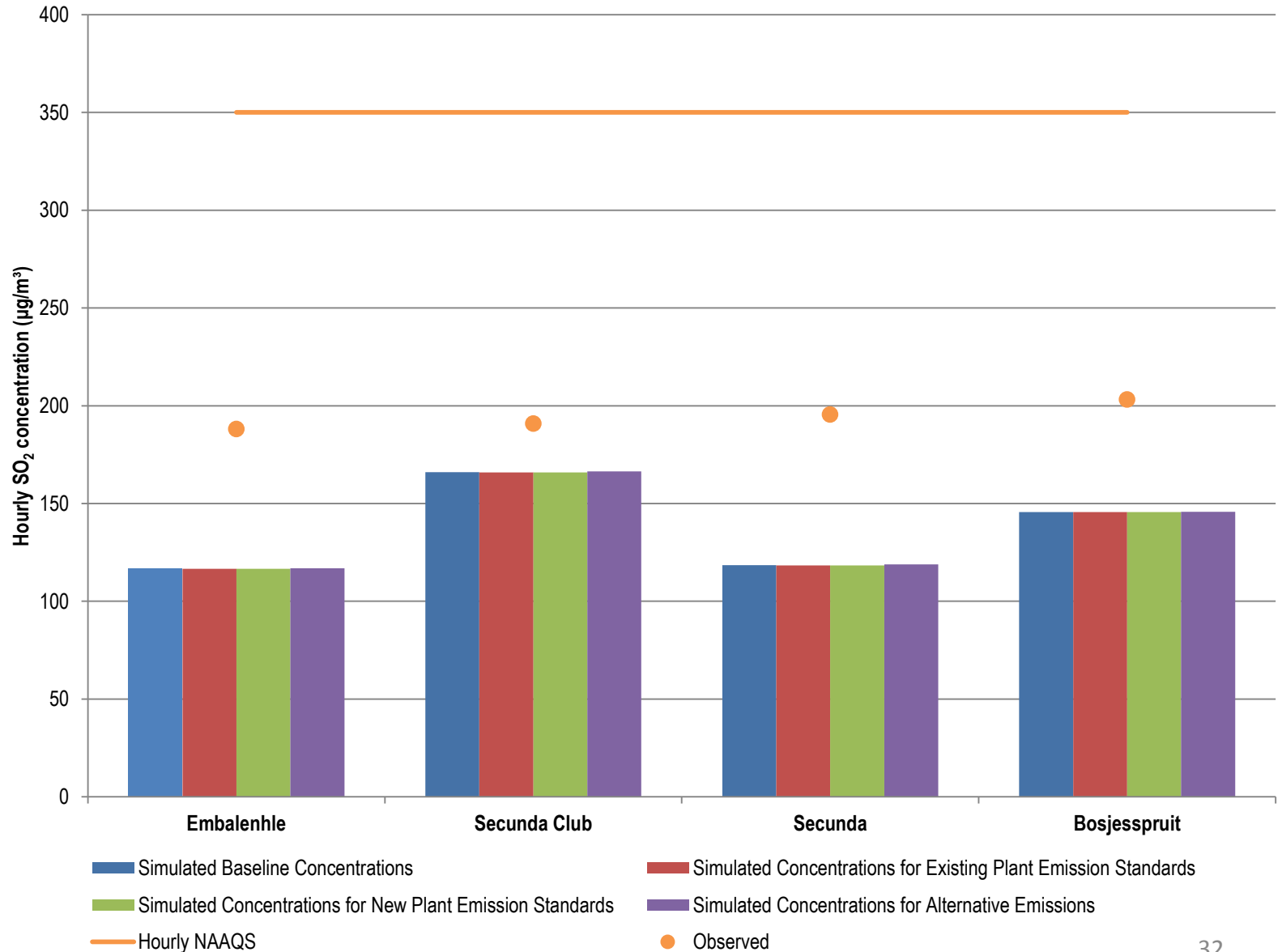


# EMISSION SCENARIOS

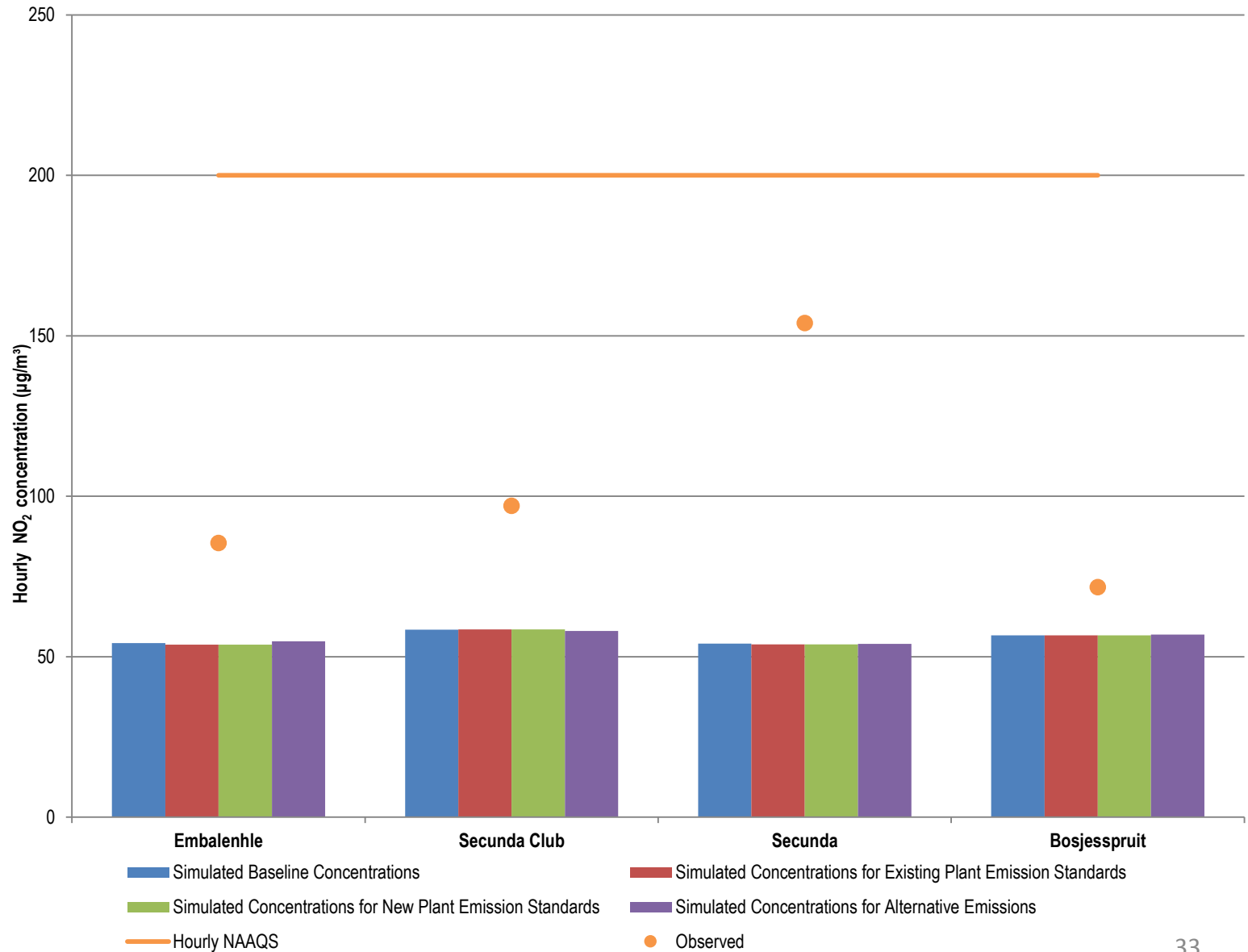




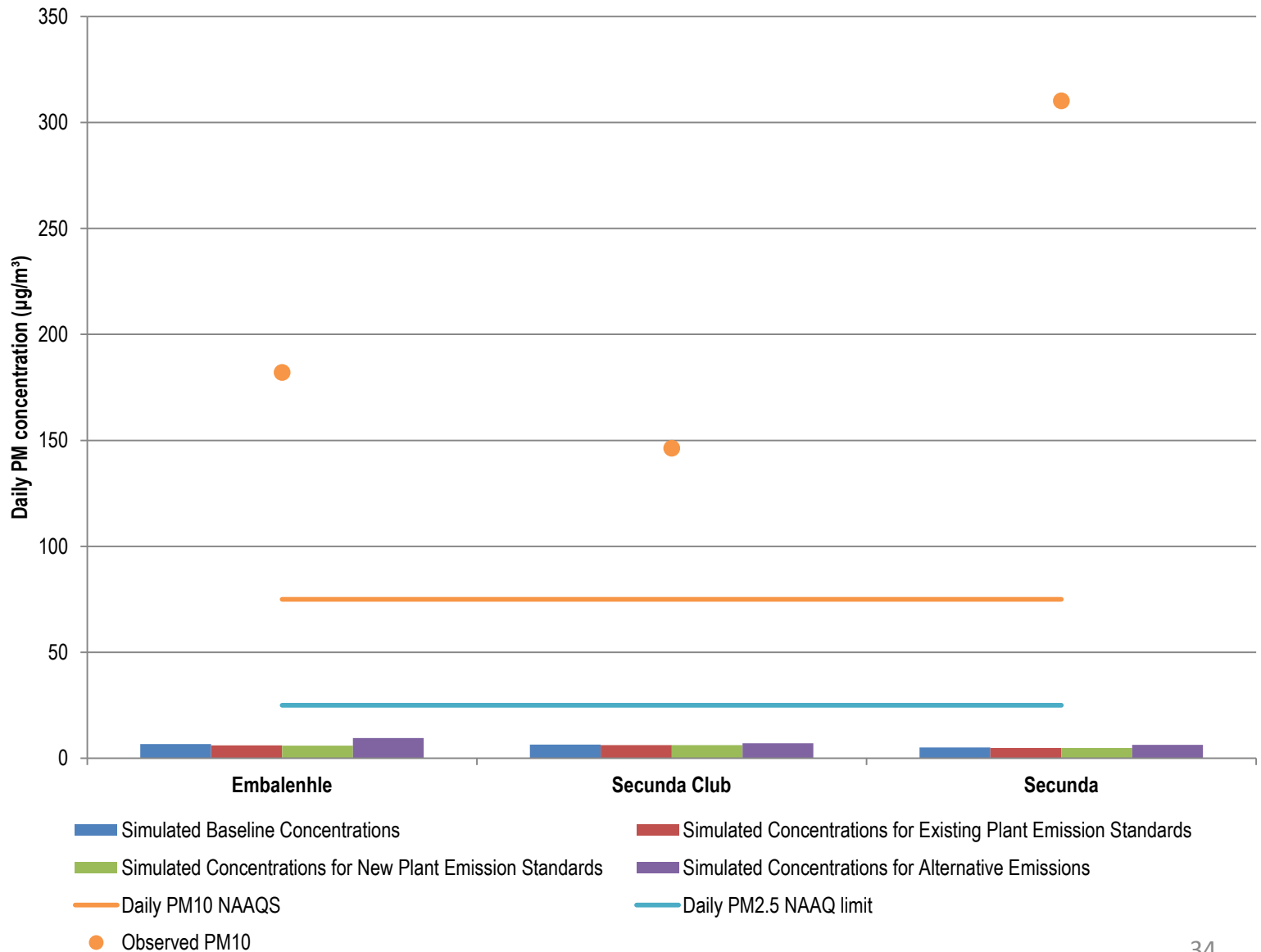
# SIMULATED RESULTS: SO<sub>2</sub> (hourly)



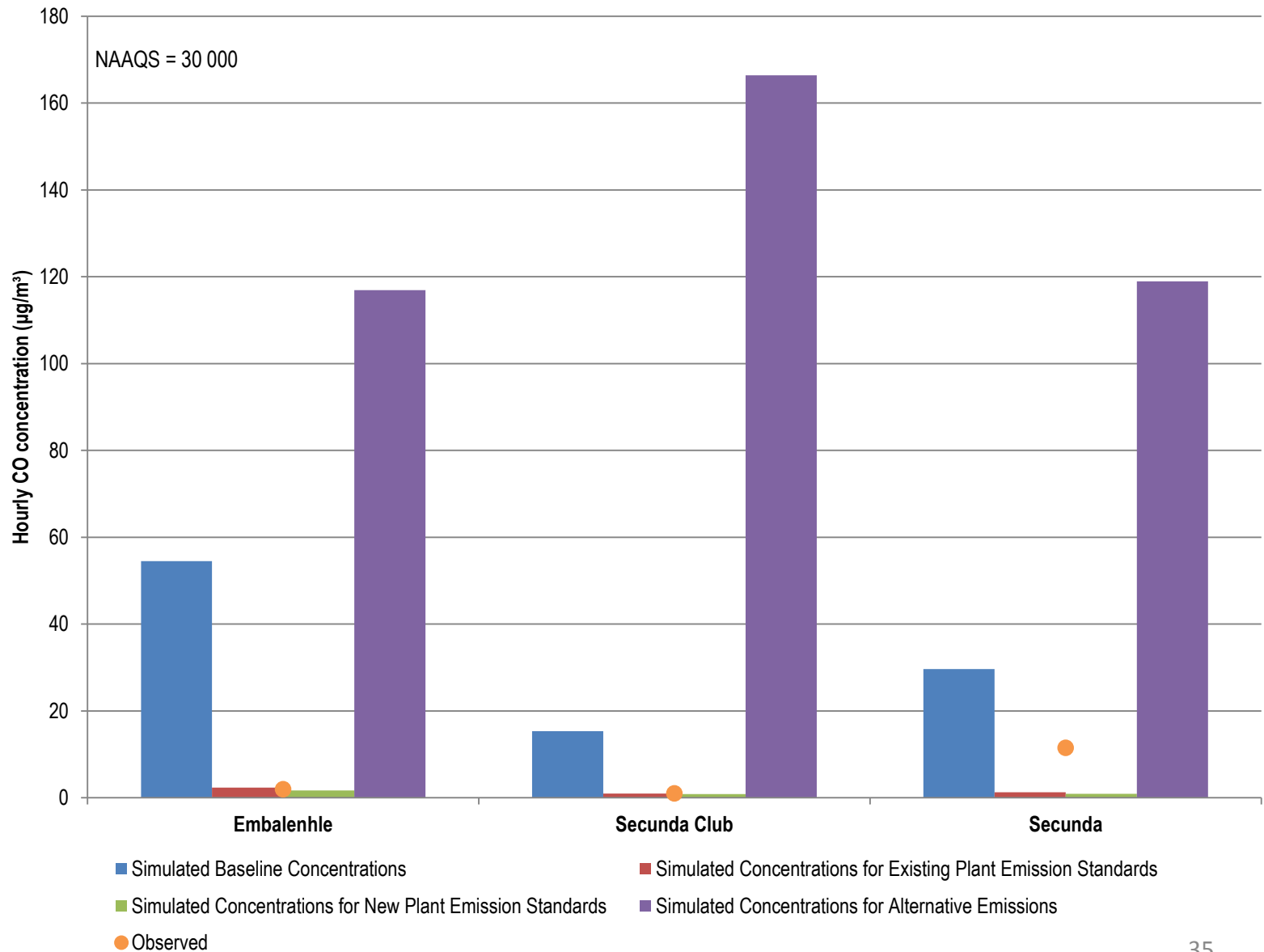
# SIMULATED RESULTS: NO<sub>2</sub> (hourly)



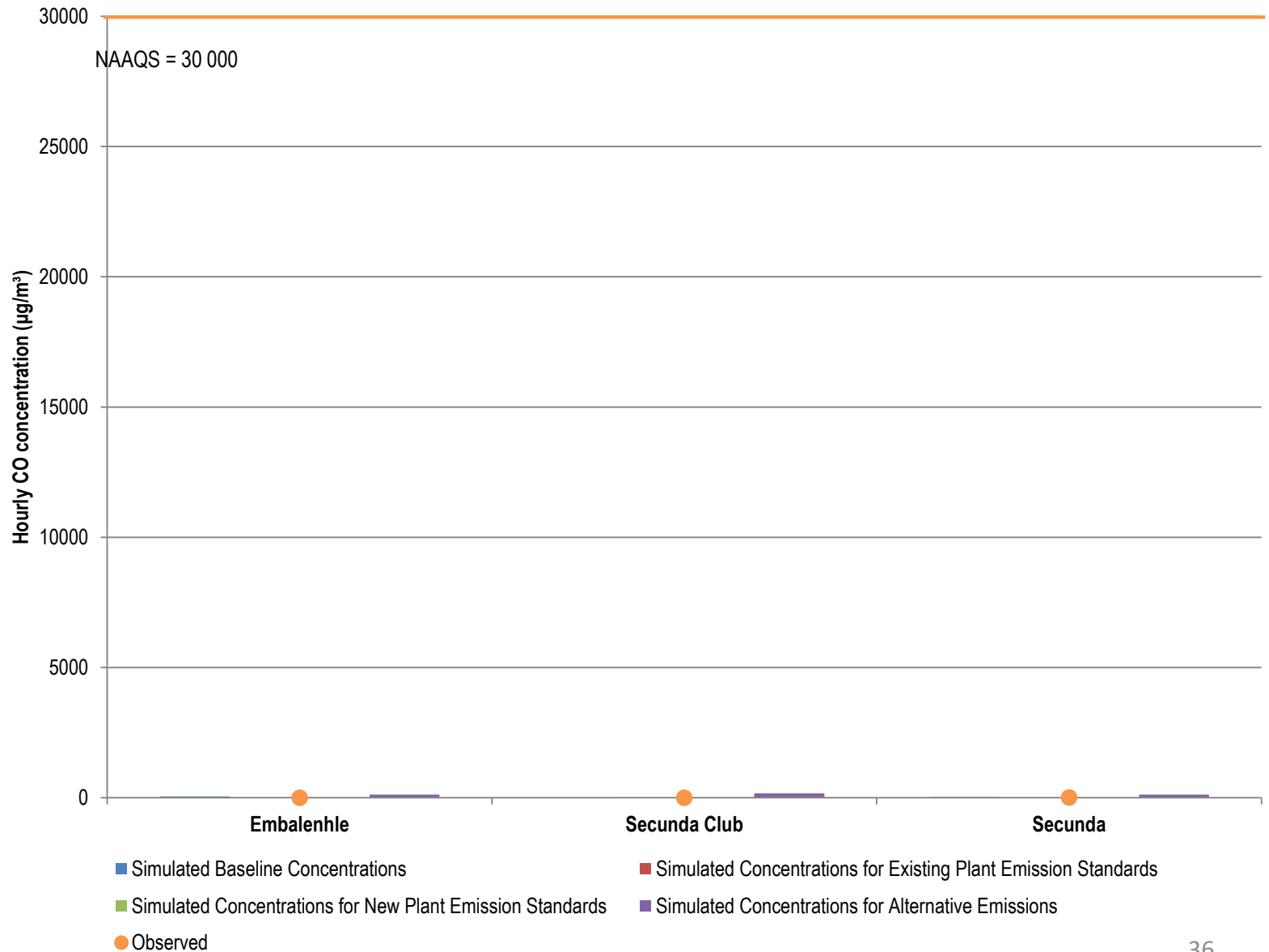
# SIMULATED RESULTS: PM (daily)



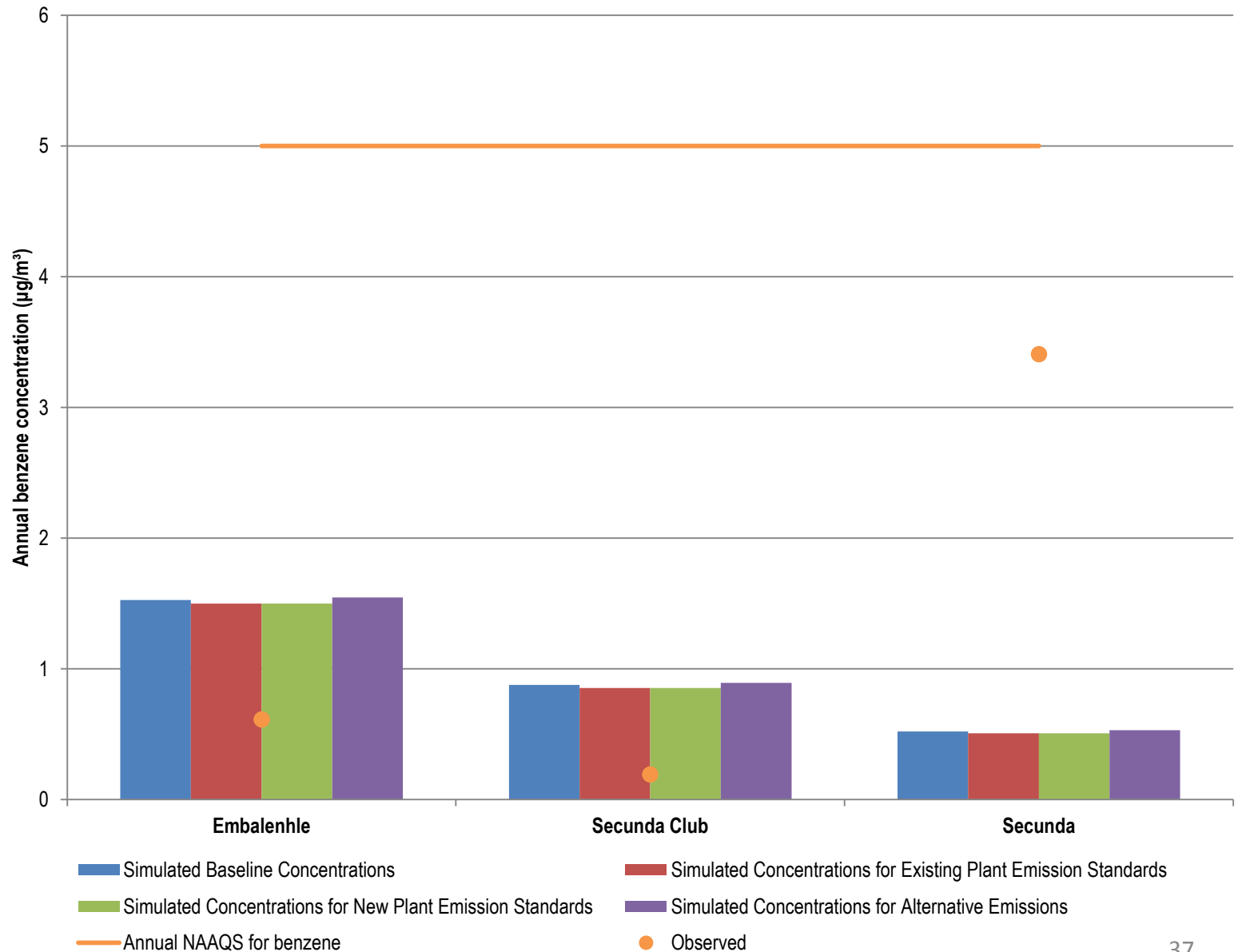
# SIMULATED RESULTS: CO (hourly)



# SIMULATED RESULTS: CO (hourly)



# SIMULATED RESULTS: Benzene (annual)



# CONCLUSIONS

## ANALYSIS OF IMPACTS ON HUMAN HEALTH

- **PM<sub>10</sub>/PM<sub>2.5</sub>**
  - **Measured** ambient air quality
    - Within NAAQS
  - **Simulated** impacts from Sasol
    - Within NAAQS
- **SO<sub>2</sub>**
  - **Measured** ambient air quality
    - Within NAAQS
  - **Simulated** impacts from Sasol
    - Within NAAQS
- **NO<sub>2</sub>**
  - **Measured** ambient air quality
    - Within NAAQS
  - **Simulated** impacts from Sasol
    - Within NAAQS
- **CO**
  - **Measured** ambient air quality
    - Within NAAQS
  - **Simulated** impacts from Sasol
    - Within NAAQS
- **Benzene**
  - **Measured** ambient air quality
    - Within NAAQS
  - **Simulated** impacts from Sasol
    - Within NAAQS

# CONCLUSIONS

## ANALYSIS OF IMPACTS ON THE ENVIRONMENT

- Critical levels for vegetation assessed using the international methodology
  - off-site exceedances unlikely for all vegetation types for SO<sub>2</sub> and NO<sub>2</sub>.
- Dustfall rates estimated from simulated particulate concentrations
  - off-site compliance with National Dust Control Regulations
- Corrosion rates estimated from simulated pollutant concentrations
  - Maximum of 23 µm per year for steel (on-site)
  - No benchmark for acceptability
- Literature findings suggest that grassland ecosystems of the Highveld are not yet affected by sulfur and nitrogen deposition.
- Literature review of potential effects of benzene on environment provided
  - No benchmark for acceptability



# FURTHER DETAIL CONTAINED IN THE AIR

- Methodology (**international peer review** feedback in motivation report);
- Model **validation**;
- Results per **receptor** and the percentage change in ground-level concentrations between scenarios;
- **Long-term** simulated results (daily and annual);
- **Contour plots** of simulated results;
- Results for other **non-criteria** pollutants.

# Alternative Emissions Limits Proposed to Apply During Postponement Period



## Incinerators

## Phenosolvan

Emission component	2015 <i>Existing Plant Standards</i>	2020 <i>New Plant Standards</i>	HOW Incinerators	Biosludge Incinerators
PM	25	10	1354	600
SO <sub>2</sub>	50	50	546	205
CO	75	50	1400	4422
NO <sub>x</sub>	200	200	3800	714
Pb+As+Sb+Cr+ Co+Cu+Mn+Ni+V	0.5	0.5	21	2.6
Cd+Tl	0.05	0.05	0.12	0.12
Hg	0.05	0.05	0.27	0.95
NH <sub>3</sub>	10	10	12	52
HF	1	1	10	20
HCl	10	10	55	29
TOC	10	10	38	4216
Dioxin & Furan	0.1	0.1	4.2	0.31

VOCs

MES

- New (2020) – 130
- Existing (2015) – 250

Alternative - 58000

# Stakeholder Engagement Process



Public comment  
period:

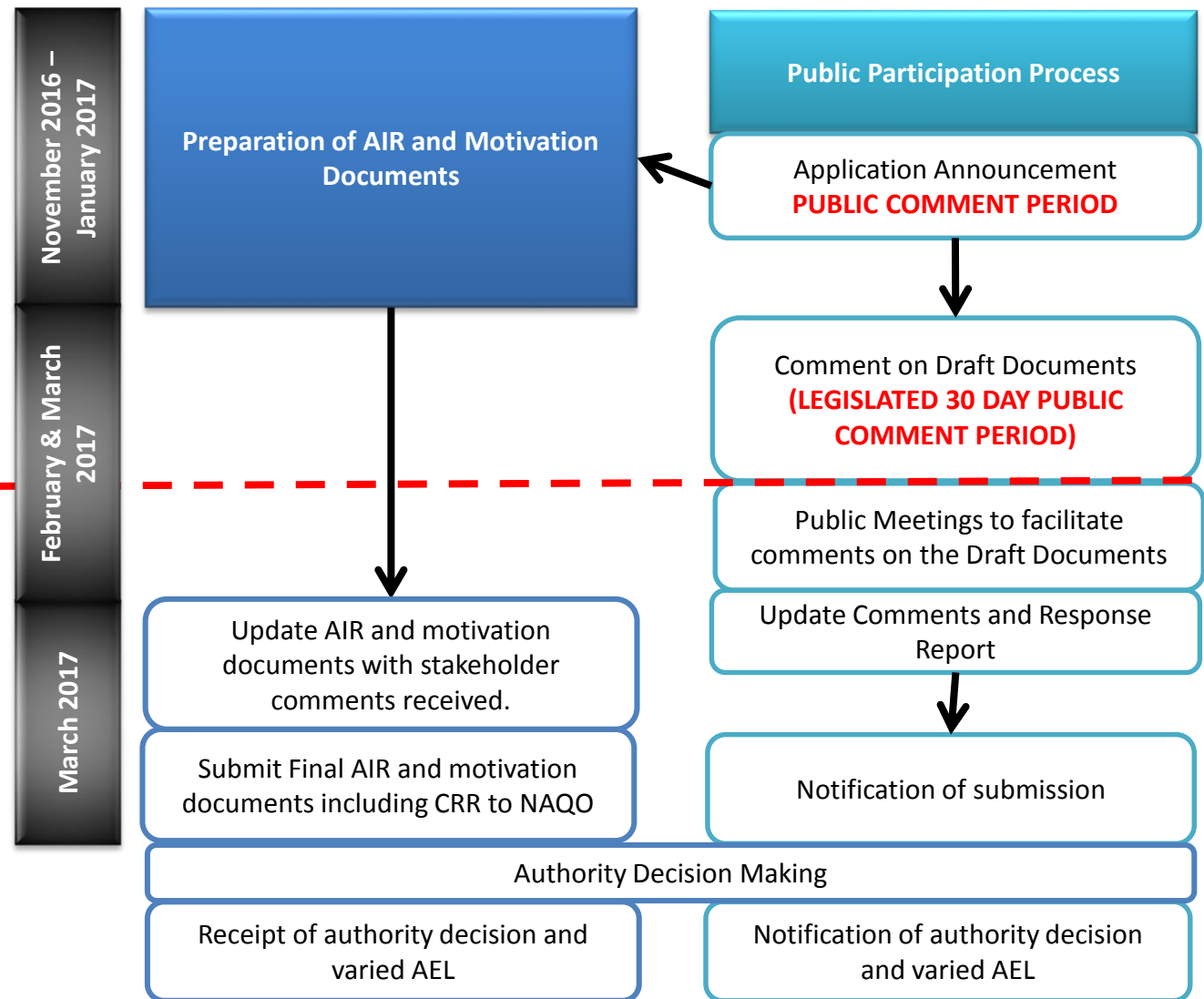
06 February 2017 –  
8 March 2017

Public Meetings  
21-23 February 2017

We are Here

Way Forward

# Overview of Public Participation Process





Draft Reports will  
be available for  
public comment  
until

**8 March 2017**

# Invitation to comment

- Should you wish to register as an interested and affected party or comment on the postponement application documents
- Please complete the registration and comment forms and submit it to SRK, by **8 March 2017** provided at the meeting or available from <http://www.srk.co.za/en/za-sasol2017postponement>
- Or complete the online survey at:  
<https://survey123.arcgis.com/share/54be1726480f431da550e8e01c44b331>

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Definitions in terms of NEM:AQA and MES (GN 893) that have relevance to this application:

**Existing Plant** – Any plant or process that was legally authorised to operate before 1 April 2010 or any plant where an application for authorisation in terms of the National Environmental Management Act (Act No.107 of 1998) was made before 1 April 2010.

**Fugitive emissions** - emissions to the air from a facility, other than those emitted from a point source.

**Licencing Authority** – refers to an authority responsible for implementing the licensing system.

**Listed activity** – In terms of Section 21 of the NEM:AQA, the Minister of Environmental Affairs has listed activities that require an AEL. Listed Activities must comply with prescribed emission standards. The standards are predominantly based on 'point sources', which are single identifiable sources of emissions, with fixed location, including industrial emission stacks, called a "point of compliance".

**Minister** – The Minister of Environmental Affairs.

**New Plant** – Any plant or process where the application for authorisation in terms of the National Environmental Management Act (Act No.107 of 1998) was made on or after 1 April 2010.

**Point of compliance** – means any point within the off gas line, where a sample can be taken, from the last vessel closest to the point source of an individual listed activity to the open-end of the point source or in the case of a combination of listed activities sharing a common point source, any point from the last vessel closest to the point source up to the point within the point source prior to the combination/interference from another Listed Activity.

**Point source** – A single identifiable source and fixed location of atmospheric emission, and includes smoke stacks.

**Priority area** - means an area declared as such in terms of Section 18.

**Priority area air quality management plan** - means a plan referred to in Section 19.

**Total volatile organic compounds (VOCs or TVOCs)** – means organic compounds listed under US-EPA Compendium Method TO-14.

Additional definitions provided for the purpose of clarity:

**Alternative emissions limits** – the standard proposed by SSO based on what is considered reasonable and achievable as a consequence of the various technical and environmental assessments conducted and which SSO proposes as an alternative standard to be incorporated as a licence condition with which it must comply during the period of postponement. The alternative emissions limits are specified as ceiling emissions limits or maximum emission concentrations, as defined in this Glossary. In all instances, these alternative emissions limits seek either to maintain emission levels under normal operating conditions as per current plant operations, or to reduce current emission levels, but to some limit which is not identical to the promulgated MES (as defined). Specifically, these alternative emissions limits do not propose an increase in current average baseline emissions.

**Alternative special arrangements** – An arrangement different to that contained in Part 3 of GN 893 and proposed by SSO based on what is considered reasonable and achievable as a consequence of the assessments conducted and which Sasol proposes as an alternative special arrangement to be incorporated as a licence condition with which it must comply during the period of postponement. The alternative special arrangement proposed for the Phenosolvan plant pertaining to the inclusion of this source in the site fugitive emission monitoring plan.

**Ambient standard** - The maximum tolerable concentration of any outdoor air pollutant as set out in the National Ambient Air Quality Standards in terms of Section 9(1) of the NEM:AQA.

**Atmospheric Emission License** – SSO Atmospheric Emission Licence: Licence no. Govan Mbeki/Sasol Chemical Industries (Pty) Ltd 0016/2015/F02 31 March 2015 issued to Sasol in respect of its Secunda Synfuels Operations, formerly Sasol Synfuels.

**Atmospheric Impact Report** - in terms of the Minimum Emission Standards an application for postponement must be accompanied by an Atmospheric Impact Report as per Section 30 of NEM:AQA. Regulations prescribing the format of the Atmospheric Impact Report (AIR) were published in Government Notice 747 of 2013.



## Glossary



**Ceiling emissions limit** – Synonymous with “maximum emission concentrations”. The administrative basis of the MES is to require compliance with the prescribed emission limits specified for existing plant standards and new plant standards under all operational conditions, except shut down, start up and upset conditions. Whereas average emission values reflect the arithmetic mean value of emissions measurements for a given process under all operational conditions, the ceiling emission would be the 100th percentile value of emissions measurements obtained. Hence, ceiling emission values would be higher than average emission values, with the extent of difference between ceiling and average values being dependent on the range of emission levels seen under different operational conditions. Since the MES specify emissions limits as ceiling emissions limits or maximum emission concentrations, SSO has aligned its proposed alternative emissions limits with this format, to indicate what the 100th percentile emissions measurement value would be under any operational condition (excluding shut down, start up and upset conditions). It is reiterated that SSO does not seek to increase emission levels relative to its current emissions baseline through its postponement applications and proposed alternative emissions limits (specified as ceiling emission limits), but rather proposes these limits to conform to the administrative basis of the MES.

**Criteria pollutants** – Section 9 of NEM:AQA provides a mandate to the Minister to identify a national list of pollutants in the ambient environment which present a threat to human health, well-being or the environment, which are referred to in the National Framework for Air Quality Management as “criteria pollutants”. In terms of Section 9, the Minister must establish national standards for ambient air quality in respect of these criteria pollutants. Presently, eight criteria pollutants have been identified, including sulfur dioxide ( $\text{SO}_2$ ), nitrogen dioxide ( $\text{NO}_2$ ), ozone ( $\text{O}_3$ ), carbon monoxide ( $\text{CO}$ ), lead ( $\text{Pb}$ ), particulate matter ( $\text{PM}_{10}$ ), particulate matter ( $\text{PM}_{2.5}$ ), benzene ( $\text{C}_6\text{H}_6$ ). In this document, any pollutant not specified in the National Ambient Air Quality Standards (“NAAQS”) is called a “non-criteria pollutant”.

**Existing plant standards** - The emission standards which existing plants are required to meet. Emission parameters are set for various substances which may be emitted, including but not limited to, for example,  $\text{PM}_{10}$ , nitrogen oxides ( $\text{NO}_x$ ) and  $\text{SO}_2$ .

## Glossary



**Fugitive emission monitoring plan** – The plan detailing monitoring of fugitive emissions from equipment, pumps, tanks and other non-point sources on the Secunda site and the associated corrective actions to manage these emissions.

**GN 551** – Government Notice 551, Gazette No. 38863 dated 15 June 2016, published in terms of Section 21 of the NEM:AQA and entitled '*Amendments to the list of Activities which result in Atmospheric Emission 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** – Government Notice 893, Gazette No. 37054 dated 22 November 2013, published in terms of Section 21 of the NEM:AQA and entitled '*List of Activities which Result in Atmospheric Emissions which have or may have a Significant Detrimental Effect on the Environment, Including Health and Social Conditions, Economic Conditions, Ecological Conditions or Cultural Heritage*'. GN 893 repeals the prior List of Activities published in terms of Section 21, namely GN 248, Gazette No. 33064 dated 31 March 2010. GN 893 deal with aspects including: the identification of activities which result in atmospheric emissions; establishing minimum emissions standards for listed activities; prescribing compliance timeframes by which minimum emissions standards must be achieved; and detailing the requirements for applications for postponement of stipulated compliance timeframes.

**Maximum Emission Concentrations** – Synonymous with "ceiling emissions limits". Refer to glossary definition specific to this application for ceiling emissions limits.

**Minimum Emissions Standards** – Prescribed maximum emission limits and the manner in which they must be measured, for specified pollutants. These standards are published in Part 3 of GN 893, as amended by GN551. These standards are referred to herein as "MES".

**New plant standards** - The emission standards which existing plants are required to meet, by April 2020, and which new plants have to meet with immediate effect. MES are set for various substances which may be emitted, including, for example, PM<sub>10</sub>, NO<sub>x</sub> and SO<sub>2</sub>.

**Postponement** – a postponement of compliance timeframes for existing plant standards and new plant standards and their associated special arrangements, in terms of regulations 11 and 12 of GN 893.

**Sasol** – refers generally to Sasol South Africa (Pty) Limited and its various operations and operating entities.

**Shutdown schedule** - A programme for the scheduled period for which a plant, or a portion thereof or piece of equipment, such as a tank, is out of commission for maintenance for an extended period of time.

**Special arrangements** – Any specific compliance requirements associated with a listed activity's prescribed emissions limits in Part 3 of GN 893, as amended by GN 551. These include, amongst others, reference conditions applicable to the prescribed emission limits of the listed activity, abatement technology prescriptions and transitional arrangements.

**SSO** – the applicant in this postponement application, Sasol South Africa (Pty) Limited operating through its Secunda Synfuels Operations.

**2014 Postponement Application** - Postponement application submitted ahead of the 1 April 2015 compliance timeframe for existing plant standards, for various sources at the Secunda facility and incorporated into the AEL.

**2016 Postponement Application** - Postponement application submitted by SSO to extend the initial two year compliance extension granted ahead of the 1 April 2015 compliance timeframe for existing plant standards, for three pitch tanks.

**2017 Postponement Application** – This postponement application to be submitted by SSO to extend the initial three year compliance extension granted ahead of the 1 April 2015 compliance timeframe, for the Phensolvan plant and HOW and Biosludge incinerators.